WIRE & WIRE PRODUCTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

NOW IS THE TIME TO ADVERTISE!

OUT of 450,000 men employed in executive positions in 1931 only 31% retained their jobs. 35% were new men in new jobs, and 34% had new addresses.

+ + +

IF you want your share of the new business now developing you must make new contacts.

+ + +

ADVERTISING is still the best and lowest cost method of doing this.

+ + +

TELL the Wire Industry about your newest products, and get in line for your share—competition does not wait! Advertise now.

Richard E. Brown

April 1933

HAVEG

Pickling and Plating Tanks
Piping and Fittings

INDIFFERENT TO TEMPERATURE CHANGES
UNAFFECTED BY HYDROCHLORIC AND SULPHURIC ACIDS
ABSOLUTELY LEAKPROOF—STRONG—DURABLE

A 26 ft. Pickling Tank—Constructed of four solid pieces of Haveg and fastened together with special Haveg Leakproof joints.

Haveg tanks are the answer to your pickling and plating tank problems. Haveg is a material composed of the well known acid resisting material asbestos, as a base, and molded into a solid homogeneous mass by mixing with a specially prepared acid resisting resin of the phenol-formaldehyde type and subjecting to heat and pressure.

Haveg tanks offer complete resistance, up to boiling temperature, against any concentration of hydrochloric acid, and sulphuric acid up to 50% concentration.

Tanks as large as 9 ft. in diameter and 9 ft. high can be made in one piece—absolutely seamless. Larger tanks can be made in sections with suitable flanges to permit fastening together. The joints are fastened and sealed so that they provide the same chemical resistance as the solid Haveg—and they are absolutely leakproof.

Haveg piping and fittings offer the same resistance to acids as Haveg tanks. The light weight of Haveg—about one-fifth the weight of iron—makes handling easy and simplifies installation of pipe lines.

All Haveg equipment is easily repaired with Havegit cement should fractures or other damage occur. Havegit is made from the same base materials as Haveg and has the same durable chemical characteristics. It is a cold setting cement and when used to fill cracks or fractures forms a perfect bond with Haveg, offering as absolute chemical and mechanical resistance as solid Haveg.

Havegit also forms a good bond with concrete, tile, brick, and even metals. It therefore has a wide use for general repair work, and as a mortar for setting tile and brick, offering even greater acid resistance than the brick or tile.

We'll be glad to send you a copy of the Haveg catalog describing all types of Haveg corrosion resistant chemical equipment. Also a sample piece of Haveg if you would like to have it.

HAVEG

HAVEG CORPORATION
Newark, Delaware

HAVEG

An American Product!!

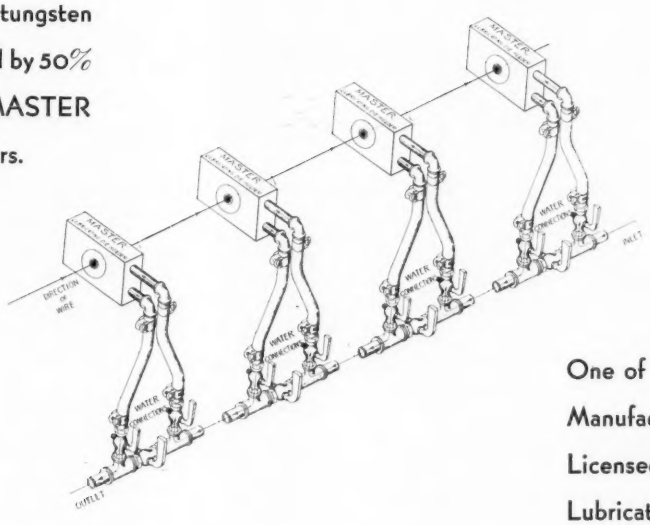
Made In America!
By American Labor!
From Raw Material
To Finished Product!

Master Lubricating Die Holders

Are Absolutely Essential For Dry Drawing

The relatively high cost of dry drawing wire with tungsten carbide dies is reduced by 50% through the use of MASTER Lubricating Die Holders.

+ + +



One of America's Leading Die Manufacturers Has Just Been Licensed to Sell MASTER Lubricating Die Holders.

+ + +

Efficient Lubrication and Water Cooling Are Features.

Value Proven In Many Leading Mills

Ask Us For Details

MASTER WIRE DIE CORPORATION

408 Concord Avenue — New York, New York

A Base Metal that Matches the Plate When Exposed by Wear

WHEN exposed by wear, 18% Nickel Silver sheet reveals the ideal "white" matching color. This is true of the rod stock also. But—manufacturing an 18% Nickel Silver rod *with full lead content* for free turning is so much more difficult than rolling an 18% non-leaded sheet that the accomplishment is far from commonplace!

For over fifty years The Seymour Mfg. Co. has supplied this type of Nickel Silver rod.

The piston stems in the trumpet valves above are good examples of its use in maintaining a matching color. In course of time the constant rubbing of hands and gloves and hundreds of polishings wear through the plating of these stems—yet they still match the instrument.

Seymour 18% Nickel Silver rod is used not only in trumpet piston stems, tube braces, mouthpieces, etc., but also in the cross-rods of the better fishing reels . . . in the uprights, knobs and nuts of appliances . . . in auto trim . . . in the levers and exposed screw-heads of typewriters . . . and in numerous other plated parts where wear must not show.

Being a strong, ductile alloy, this rod can be drawn, hammered and formed; and it anneals uniformly. Because of its full lead content, it turns and threads cleanly with good production speed and with a minimum of wear on tools.

If you are looking for a free turning Nickel Silver rod of silvery white color, we shall be glad to send samples for test and contribute any helpful suggestions we can.

FOR SERVICE

THE SEYMOUR MANUFACTURING CO., 62 FRANKLIN ST., SEYMOUR, CONN.

SEYMOUR

SHEETS, WIRE, RODS

NICKEL SILVER

ALSO: PHOSPHOR BRONZE SHEETS, WIRE, RODS : AND NICKEL ANODES

WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip. Wire Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING.

Vol. 8 April 1933 No. 4

Designated as

Official Publication By The Wire Association

Contents

New Light on Wire Drawing ..... By Prof. F. C. Thompson 101
Results Obtained in Recent Research Work in Great Britain. Part II.

Music Wire Springs ..... By L. V. Williams 104
A Study to Ascertain the Most Satisfactory Coating for Music Wire Springs and Outlining the Results of Tensile and Torsional Tests Made for this Purpose.

Lime and Lime Tub Practice ..... By C. B. C. Jackson 105

The German Wire Weaving Industry ..... By Hans Nentwig 106
A Description of the Difficulties Under which this Industry Now Operates in Germany.

Stitching Wire ..... By Hubert 108
Requirements and Processes of Manufacture in the Production of Stitching Wire.

'Round the World With the Wire Industry 110

Wire Questions and Answers 114
(a) Co-operation requested in experimenting for development of lubricant binder for stainless steel wire.
(b) Data on types of lubricants for various kinds of wire drawing.
(c) What is the basis of the lubricant binder for replacing sull coat on stainless steel wire?
(d) At what sizes does the wet drawing process start?
(e) Information wanted on the manufacture of steel wire rotary brushes.
(f) Relative merits of Bessemer and Basic steel wire.

A Review of Recent Wire Patents 116

Exports and Imports of Wire 117

Buyers' Guide 127-128

—ASSOCIATE EDITORS—
Kenneth B. Lewis, Consulting Wire Mill Engineer
W. H. Spowers, Jr., Consultant on Galvanizing
L. D. Granger, Chief Metallurgist, Wickwire Spencer Steel Corp.
Lancaster, Allwine & Rommel, Consultants on Patent Information

European Correspondents

Great Britain
A. C. Blackall
7 Vincent Sq. Mansions
London, S. W. 1, Eng.

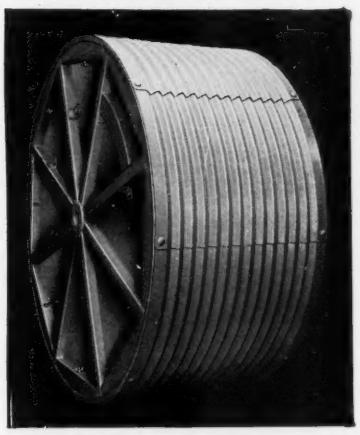
Germany & Belgium
Paul Fidrmuc
Chapeaurougeweg 15
Hamburg, Ger.

R. E. Brown, Business Manager
Executive and Editorial Offices:
17 E. 42nd St., New York City. Telephone: Murray Hill 2-4188

Publication Office: Washington, N. J.
Annual Subscription, U. S. $5.00, Canada $5.60
50 Cents a Copy Issued Monthly Foreign, $7.50

Copyright, 1933

"Red Head" Steel Reels
For Shipping Cable and Wire



We use the box section throughout. Why? Ask the engineers that design skyscrapers, the automobile chassis, and the airplane structure.

Write for description of construction and prices.

R. B. HAYWARD CO.
1714-1736 SHEFFIELD AVE.,
CHICAGO, ILLINOIS

Manufactured and sold under license arrangement with Electrical Research Products, Inc., Subsidiary of Western Electric Company, Incorporated.

"NEP"
Inhibitor

Established for 20 Years

The most widely used Inhibitor in the Wire Trade.

Produces the brightest wire with the lowest acid consumption per ton.

We specialize in Wire Pickling.

Over 400 Customers in America and Canada.

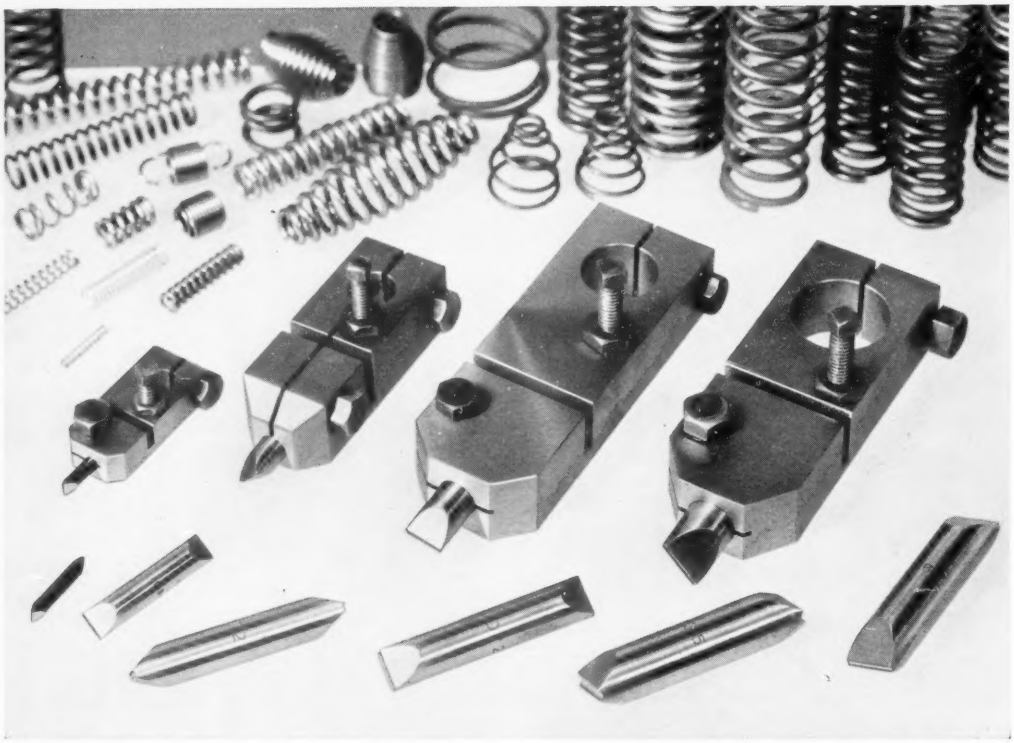
The
Wm. M. Parkin
Company

Born and raised in the Steel Industry.
Chemical Engineers.
PITTSBURGH, PA.

WIRE & WIRE PRODUCTS, Vol. 8, No. 4, April, 1933. Executive office, 17 East 42nd St., New York, N. Y. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 49 E. Washington Ave., Washington, N. J. Subscription price: U. S., $5.00; Canada, $5.60 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879.

Copyright, 1933, by Quinn-Brown Publishing Corp.

CONTINUED IMPROVEMENT



The many improvements of the illustrated Coiling Point and its Holder are obvious to the professional Springmaker. These points are more easily adjusted, produce better springs and last definitely longer than the old style points. Double-ended, they give about four times longer service. Rotatable, they conform with the pitch of the spring coil. Simpler, they are cheaper.

To the Wire Mill man these features may be all very interesting but he fails to see where they concern him.

Only to this extent; Sleeper & Hartley, Inc. for many years has been serving the Wire Working and Spring Coiling industries. This service has entailed constant improvement. Above is illustrated an improvement for the benefit of the professional Spring Maker. We have developed just as many improvements in our Wire Mill equipment, improvements which cannot be overlooked if the purchase of new machines is contemplated.

SLEEPER & HARTLEY, INC.

WORCESTER, MASS., U. S. A.

DESIGNERS & BUILDERS OF HIGH PRODUCTION WIRE MACHINERY

WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 8 APRIL, 1933 No. 4

New Light on Wire-Drawing

Details of the Research Work Conducted at Manchester University and the Results Secured

PART II

By Professor F. C. Thompson

Manchester University, Manchester, England

IN this issue we give the second of a series of two articles which Professor F. C. Thompson has contributed dealing with the research work which he has directed at Manchester University on wire drawing. That the work is by no means complete Professor Thompson readily admits but the data which he has already established must prove invaluable to the industries connected with the drawing of wire. To take only one example from this work, the experiments have suggested that the best lubricant is a hard soap. In the non-ferrous wire-drawing trades, however, liquid or greasy lubricants are almost invariably preferred. But a further point is of interest, for while in practice care is taken to cool the lubricant these experiments have shown that if the temperature is allowed to rise, to the boiling point of water for instance, then some greasy or liquid lubricants are equal to or better than, hard soap. The main consideration of the experiments has been power consumption and this is inevitably an aspect of the problem which appeals very strongly to the wire-drawer on account of the possible reduction in operating costs. Professor Thompson sounds a note of warning, however, when he points out that this is "only one of the problems to be solved. The mechanical properties of the material and relative costs in other directions are of at least equal importance." Obviously the research work must be continued, but, in the meantime, the wire-drawing trades must be exceedingly grateful for the valuable facts which this work has already placed in their hands.

The Editor

III—Die Angle and Power Consumption

ANOTHER question of considerable importance is the effect of the surface finish of the hole. So far as the work has yet gone it would appear that this can hardly be too good. The following figures are quite typical of many which have been obtained, and even more striking differences in the power needed as the surface becomes rougher, even with the most perfect lubrication which can be given, could be cited. The figures refer to a soft (7 per cent nickel) nickel-silver wire of the same original diameter as the one quoted immediately above. This was drawn down in carbide dies by 20 per cent. With a moderate (certainly not a bad) surface polish the tension required was 122 lb. By preparing the same die to the highest degree of polish which could economically be given, and under otherwise exactly the same conditions, the pull fell to 97 lb., representing an economy in power of about 25 per cent. The only other point with regard to the best die angle which needs mention is that this again appears to be essentially independent of the perfection of the lubrication.

+ + +

WHY there should be this minimum in the curve of power to the die angle appears to be bound up with two distinct factors. As the angle is increased, if the coefficient of viscosity of the lubricant remained unchanged, the power needed should fall at first rapidly and later more and more slowly. For a given angle of the die, on the other hand, the power increases with the viscosity of the lubricant, and it is the net effect of these two influences which appears to lead to the somewhat curious results which have just been discussed.

+ + +

Radial Taper or Conical Hole

THE final aspect of die design which has to be considered is

Published by arrangement with the Manchester Commercial-Guardian.

the comparison of the die with a conical aperture and one with the so-called radial taper, in which the hole is trumpet shaped, the diameter decreasing at a progressively diminishing rate from the entrance to the exit end. The relative expenditure of power for dies of the two contours has been measured for a considerable number of materials with completely consistent results. The tension needed with radial tape is invariably higher than that for the plain conical hole, the net result being much the same as if a conical die were used in each instance, but on the one hand with good, and on the other with very inefficient lubrication. For a 20 per cent reduction of area, the increased power demanded by the use of the radial taper die varied from 15 to 40 per cent, being in general larger as the material to be drawn was softer. Thus for soft copper the radial taper die required 39 per cent more power than was needed for the plain conical die of the best angle, whilst for Monel metal in the same circumstances the increase amounted to 15 per cent only.

✦ ✦ ✦

THE same state of affairs holds for other reductions, but as this is increased the difference between dies of the two contours becomes rather less marked. For a reduction of area of 35 per cent the radial die was worse to the extent of some 12 per cent for soft copper and only 5 to 6 per cent for a nickel silver. There are many considerations other than that merely of the power used which determine the practice adopted by the drawer of wire, but on the face of it it is not easy to understand the extensive use of the radial bearing, especially in connection with non-ferrous metals and alloys. It is not improbable that radial tapered dies were first prepared more or less accidentally and have been retained through conservatism. One of the major objections to the use of such dies is the practical impossibility of accurately controlling the exact radius of curvature.

AN aspect of the subject on which, as yet, very little work has been carried out is the rotation of the die whilst the wire is passing through it. The writer's attention was first drawn to this question by a chance observation of one of his students, Mr. H. Greenwood, M.Sc., who later on obtained the results which will be given subsequently. Since this section of the work was first undertaken it appears that others have used rotating dies for drawing wire, but for the most part these experiments have been carried out with objects other than that of reducing the power consumption, with which we have been mainly concerned. It should be pointed out that as yet this work has been done only at quite low speeds of drawing and the extension to commercial rates offers one of the most interesting subjects for further research in the whole of this field. It is anticipated that this will be done within the next few months.

✦ ✦ ✦

Rotating Dies

WHEN a cupro-nickel wire 0.073 in. in diameter is reduced in a single pass to 0.0635 in., a reduction of 24 per cent, the pull required through the stationary die was 82 lb. The die, which was of sintered tungsten carbide, had a semi-angle of 6 deg. and was lubricated with "oil-dag," a suspension of colloidal graphite in oil. As the speed of rotation of the die was increased the pull necessary to effect the same reduction fell progressively. At fifty revolutions per minute it had diminished to 61 lb., at 160 r.p.m. to 51 lb., whilst at 3,300 r.p.m. it was only 21 lb., a reduction of no less than 75 per cent. The decrease as the speed of rotation is raised above about 2,000 r.p.m. is, however, increasingly small, and it is exceedingly doubtful whether the higher rates of rotation are justified. It was mentioned earlier that this work had up to the present been confined to very low rates of drawing, and in these cases the work necessary to rotate the die considerably exceeds that saved by the reduction in tension. It does not follow, however, that this state of affairs will still hold at commercial rates of drawing wire. There is, at any rate, some evidence that the saving of power due to the rotation of the die increases with the speed of drawing at a distinctly greater rate than does the increased consumption due to the work done in turning the die round.

✦ ✦ ✦

THERE is some evidence that the wire produced through rotating dies is in some way different from that manufactured in the ordinary manner, and it is not beyond the bounds of possibility that for certain purposes this difference may prove of industrial importance. For otherwise similar treatment brass wire drawn through fixed and rotating dies has at these low drawing speeds the same tensile properties in both conditions. The torsional tests are, however, distinctly different, and there is good reason to believe that the annealing properties of the two materials may differ considerably.

✦ ✦ ✦

IV.—Reduction in One or More Passes

ANOTHER aspect of the power requirements in wire-drawing of no inconsiderable importance is that bound up with the question as to whether it is more economical to effect a given amount of reduction in one or in several passes without any intermediate annealing. The results obtained for a 7 per cent nickel-silver in this connection will, therefore, not be without interest. A wire 0.0725 in. in diameter was drawn down to 0.056 in. first in a single pass and secondly in two passes, first to a diameter of 0.0635 in. and then to the same final size as before. The tension required for the single pass was 148 lb. and for the two successive passes 84 lb. and 96 lb. respectively. It can be shown that the total work done when the reduction is carried out in two stages is about 9 per cent greater than when done in one stage only. At the same time it will be seen that the power necessary in the latter case is some 50 per cent greater than in the

former, and it is a matter for the individual case whether the relatively small saving in total power is more advantageous than the possibility of drawing the wire down to the required size with a distinctly smaller motor.

✦ ✦ ✦

PASSING on to consider the effect on the power consumption of the reduction of area effected per pass, it has been shown that to a first approximation the former is a linear function of the latter. This applies for good and bad lubricants and for both soft and already hard drawn materials. For drawing under ideal conditions, where the lubrication is nearly perfect, the curve passes through the origin, whilst as the loss of energy due to friction rises the curve, though parallel to the ideal, is displaced by a constant amount. It follows that the frictional loss is practically constant and independent of the amount of reduction to which the material is subjected. The range over which the power is a linear function of the reduction of area is less for steel and the ferrous metals than for non-ferrous alloys. With the latter it is not until over 40 per cent reduction had been put upon the material that the curve falls away from a straight line, whilst with the steels there was some divergence even at 30 per cent reduction.

✦ ✦ ✦

IN all cases the effect at high reductions was in the order of a diminished power consumption compared with that which the lower reductions would lead one to expect. This apparent softening of the material when the pass is very severe may be due to some intrinsic change in its structure, or possibly to the higher temperature which is attained. That much heat is generated and that the wire does rise in temperature appreciably is self-evident when the wire is handled immediately after coming out of the die. Not only does this tend to soften the material, but, what is in all probability a much more important fact, as will be seen later, the efficiency of the lubricant becomes markedly better.

THE overwhelming importance of lubrication in the wire-drawing process has, by implication, already been stressed, but although a considerable amount of work has been done on this subject the whole question is one of such complexity that little in the way of generalization is as yet possible. So far as the experiments for which the writer has been responsible go it would most certainly appear that the "best" lubricant—i.e., the one which requires the least power, is a hard soap. Such material has been used by the drawer of steel wire for a very long time, but its use in the non-ferrous industry is comparatively uncommon. In the latter trade liquid or greasy lubricants are, in general, preferred, but none of those commercially employed can compare with a good soap from the point of view of frictional loss.

✦ ✦ ✦

Lubrication and Temperature

AS one instance of the importance of this the figures given below are useful. For a 20 per cent reduction of soft copper 0.072 in. in diameter the tension required with soap lubrication was 13 lb. With castor oil, an excellent example of a liquid lubricant, the work necessary was exactly doubled, whilst with another proprietary liquid lubricant it was over three times the original value. The lubricating efficiency of the liquid lubricants used has been examined, and in all cases a very considerable improvement occurs as the temperature at which they are employed is increased. At temperatures of just over 100 deg. c. some, at any rate of them are equal to, or even better than, the soap. This fact which has been abundantly confirmed is of some interest in connection with the care taken to *cool* the lubricant in continuous drawing. There is another interesting feature of comparison between the two types. With soap the wire as it emerges from the die is dull, due to a thin layer of soap covering the whole surface. That the soap does come through in this manner can be shown by actually dissolving it off, or by the characteristic odour when the wire is annealed. When bright drawn wire is required this is clearly a matter of moment and a liquid, and not too efficient lubricant is then necessary. As the efficiency of the lubrication becomes less and less the wire drawn becomes brighter, and from this point of view some excellent results have been obtained by the use of water only at a temperature as near to the boiling point as possible. At such temperatures water is quite a fair lubricant, and the absence of any surface deposit on the wire leads to an excellent surface polish.

✦ ✦ ✦

THIS account of work already done can clearly cover but a small section of the whole subject of the drawing of wire. The consideration has in the main been devoted to those aspects of the problem which are concerned with the power consumed. To the industry this is, however, only one of the problems to be solved. The mechanical properties of the material and relative costs in other directions are of at least equal importance. It is not wise, therefore, to read into this account more than is actually contained. As one example of the necessity for this warning the following point may be considered in conclusion. It has been shown that the power used is a minimum, for a given set of conditions, when the die used has a conical hole the semi-angle of which is just over 5 deg. One instance has previously been cited where it may be advisable on other grounds to diverge from this value. Another similar instance is connected with the drawing of wire when the final reduction of area is to be small. The smaller the percentage reduction of area for a die of given angle the smaller will be the area of contact of metal and die and the greater, therefore, the tendency to "pull out". It follows that for a reasonably long life of die the bearing surface must not be too small. For very small reductions this requirement demands the use of dies with holes less than that which consumes the least power, and, therefore, dies down to 4 or even 3 deg. are commonly employed in such cases.

Music Wire Springs

By L. V. Williams,

Telephone Apparatus Dept., Bell Telephone Laboratories, New York City

A study to ascertain the most satisfactory coating for music wire springs and outlining the results of tensile and torsional tests made for this purpose.

MUSIC wire might be termed the aristocrat of spring materials. It has a tensile strength, arising chiefly from its method of manufacture, which is greater than that of any other ordinary engineering metal. Associated with this extreme tensile strength are a high modulus of elasticity, a high elastic limit, and a surprising amount of toughness for steel of such great strength. Music wire only .005 inches in diameter may have a tensile strength of 700,000 pounds per square inch and yet be ductile enough to be kinked without breaking. Steel made by any other process and having a strength of 250,000 pounds per square inch would be almost sure to break at a very slight amount of bending.

✦ ✦ ✦

AS its name suggests, music wire was originally developed for musical instruments, principally the piano, but because of its excellent physical properties, it has become an important engineering material. The great majority of the helical springs employed in telephone apparatus are made from it. Commonly used sizes vary from one to twelve hundredths of an inch in diameter, although wire may be obtained as small as four thousandths of an inch, which is the size employed for "E" strings of mandolins and violins.

✦ ✦ ✦

LIKE any other steel, music wire is very susceptible to corrosion, and because of the small diameters employed a very small amount may cause failure under the high stresses to which it is subjected. To diminish deterioration of this nature, the wire is commonly given a protecting coating of one kind or another—usually of tin. Such a coating is applied by drawing the wire through a bath of molten tin and then through a die which wipes off any excess.

✦ ✦ ✦

ALTHOUGH the corrosion resistance of wire protected in this manner is much better than that of the unplated material, it is not entirely satisfactory. In most of the commercial wire the thickness of the tin coating is not sufficient to provide protection over a long period. Because of the softness of the coat it may be easily scratched through in the thin places. Because of the difference in electro-potential between steel and tin, the wire will then corrode at the points where the plating has been broken through, and the rate will be even more rapid than if the plate were not present. If a heavier and more uniform coating were commercially obtainable the tinned wire would be satisfactory from a corrosion standpoint. However, the high temperature of the molten tin produces a slight annealing of the steel. This would not be particularly objectionable if the annealing action were entirely uniform, but frequently some parts are annealed more than others, and soft spots result. These cause an uneven action of the springs, and a loss in tension, which necessitates readjustment or replacement.

✦ ✦ ✦

MAXIMUM life in service is obtained when a most favorable relationship exists between the resistance of a spring to corrosion and its ability to undergo a large number of operating cycles without failing under the applied stresses. In the large majority of springs used in the Bell System, the stresses set up upon operation are of a torsional nature, caused by a twisting of the wire as the coiled spring is compressed or extended. To determine the most satisfactory coating, therefore, the ability of the plated spring to withstand torsional fatigue must be determined, and the best combination of corrosion and fatigue resistance selected.

✦ ✦ ✦

IT is known from experience that a zinc coating offers the best protection against corrosion and that tin, applied as described above, is less satisfactory. Nickel, and a combination of nickel and copper in separate layers, rank with tin in effectiveness. Nickel and nickel-copper finishes as well as the zinc were considered satisfactory in regard to corrosion resistance and were included in a study made to determine the most effective plating. Tin was not included because of the uneven annealing effect mentioned above.

✦ ✦ ✦

IT is an unfortunate fact that all forms of protective coatings seem to decrease the life of the original wire. The effect of tin coatings has already been mentioned. The other coats are applied by electro-plating and it has been found that the hydrogen, released on the surfaces in the process, seems to produce brittleness. Hydrogen is also released in the cleaning step which precedes plating, with a similar effect.

✦ ✦ ✦

STUDIES to ascertain the most satisfactory coating for music wire springs must determine the resistance of the plated wires to

torsional fatigue stresses, regarding which there are, at the present time, no reliable data available. There is also no accepted method of making such studies on specimens of wire. It was necessary, therefore, to obtain the desired information by making up springs with the platings which were to be investigated, and by running life tests on them. These tests were performed on standard compression type springs and operated under simulated service conditions. It was found that nickel or zinc plated springs performed equally well and both were much better than those with the nickel copper plate which has been the previous standard electro-plated finish.

✦ ✦ ✦

TESTS of tensile and torsional strength were also made to determine what relationship there might be between the life of the springs and these characteristics. The tests showed no direct correlation between the life tests and either tensile strength or torsional strength. It was found in the tensile test that nickel had the least deleterious effect upon the strength of the wire, that the combination of nickel and copper ranked next. and that zinc was the poorest of the electro-plated materials, although tin applied in the molten state decreases the strength of the wire to an even greater extent. It was also found that by heating plated wires to a temperature slightly below 200° C. much of the brittleness due to cleaning and plating could be removed. It was also discovered that a slight increase in the tensile strength of the unplated wires could be obtained by a similar heating. This increase in strength was slight and so was not considered to have any great practical application.

✦ ✦ ✦

THE results of the torsional tests agreed quite closely with those of the tensile tests, although they indicated that torsion is much more affected by variations in the wire than is tension. These tests showed that both the nickel and the zinc decreased the ductility of the music wire to a considerable extent, and that the ductility could be restored in the case of zinc plated wires by heating at temperatures between 100° C. and 200° C. Such a heating, however, produced little effect on the nickel plated wires.

✦ ✦ ✦

AS a result of these tests, it has been decided to use either nickel or zinc plating for the great majority of springs; zinc because of its excellent corrosion resistance is to be preferred for general use. Nickel, which has a satisfactory corrosion resistance, is to be preferred where springs are subjected to abrasive wear, since the nickel plate is considerably harder than the zinc. It is also planned to include a low temperature heat treatment for all zinc plated springs made with steel. This heat treatment is being used to increase the resistance of the springs to sudden surges of stress although it is not expected that it will increase the life of the springs under ordinary stress conditions.

Lime and Lime Tub Practice

C. B. S. Jackson,

Wire Mill Engineer, Worcester, Mass.

I HAVE just finished reading the reports of the last meeting of the WIRE ASSOCIATION and was surprised at the apparent lack of knowledge of one of the most important tools of the wire man—that is lime and lime tubs.

Have lately been connected with a firm whose idea of lime was something white and that was as far as their knowledge went. They figured that what was good enough for the grandfather, the son had to use. I did not realize this idea was prevalent in many other mills.

The wire man should insist on a good lime. Make the dealer furnish an analysis and have his chemist check up on this on different carloads of lime.

A good lime for wire drawing should run as follows:

Lime 95%
Insoluble .5%
Iron & Aluminum Oxides .9%
Magnesium .8%
Carbonic Acid 2.5%

This lime should be properly slacked, screened and aged.

✦ ✦ ✦

Re-Cleaning Out of Lime Tubs

This should be governed by the amount of rods or wire put thru the tubs. On a 300 ton a day mill it is a good safe bet to clean out once a month. Of course, a wire man can tell by the looks of his wire what the condition of the lime tub is but one day of poorly limed rods in the mill means a lot of grief and poor wire. Therefore, it is well to anticipate this by regular cleaning out of tubs. Lime does not cost much but scratched wire and regrets are very costly.

Good practice for 45 Bessemer rod is 3 pounds dry lime to the ton and O. H. Basic will take five pounds to the ton.

In mills making a diversified product where 3 tubs are necessary—the lime should be as follows:

Light Lime 4%
Medium Lime 6%
Heavy Lime 10%

In mills making common products only a heavy lime running 8% to 12% works satisfactorily.

The lime tub should be kept up to strength by regular practice the same as acid tubs are kept up. That is—a regular amount of lime paste should be added for so many rounds or tons of material put through the tubs.

Nothing was said about testing

(*Please turn to page 118*)

The German Wire Weaving Industry Fighting For Life
The Economic Crisis --- The Currency Crisis

By Hanz Nentwig,

Translated from Draht-Welt of May 28, 1932, by Kenneth B. Lewis, Consulting Wire Mill Engineer

THE Editor of "Draht-Welt", from which the accompanying article is translated, prefaces it with the following statement: "The publication of this interesting article by our colleague Herr Nentwig, does not imply that we share his views completely." In presenting this translation, WIRE & WIRE PRODUCTS feels more inclined to endorse this warning than the subject matter of the article.

✦ ✦ ✦

HERR NENTWIG'S unorthodox views on the functions of capital we can safely leave to our reader's judgement. His suggested prohibition of the export of looms sound very much like a proposal to lock the barn door many years after the horse was stolen. It means little to America in any event, as our looms are vastly superior to the German product, as Herr Nentwig clearly implies. In praising the astuteness of America and berating Germany in the matter of export of looms, the author overlooks the real reason for the opposite practises of the two countries, which lies in an accidental difference in trade organization. In Germany the weaver buys his looms from a loom specialist. In America the weaver designs and builds his own looms. Naturally he protects his own interests.

✦ ✦ ✦

THE most interesting things about this article is its general tone, which reflects a habit of thought peculiar to Germany; perhaps not nearly universal but common enough to rank as a national characteristic. This is apparent in the repeated contrasting of State and People as though they were separate entities. We are accustomed and rightly so, to regard our industrial system as a slow growth, rooted in the genius of the people, reflecting their capacities and their needs, and responsive to their changing conditions. To Herr Nentwig, and doubtless to many of his fellow countrymen, their industrial and financial systems are things that have been worked out for them by their superiors, the heads of the State, based on the State's conception of the needs of industry. Business is instructed to adapt itself to the chosen system. If it works ill the State is blamed, and a new system demanded. It is all very puzzling to a non-German, but none the less interesting.

✦ ✦ ✦

HERR NENTWIG'S repeated statement that weaving wire is being exported at prices very much lower than those charged in Germany will be interesting to the American wire manufacturers and should be still more interesting to the Secretary of the Treasury of the United States. (And How.)

The Editor

THE French Revolution signalized the victory of liberalism throughout Europe, in an economic as well as a political sense. The consequence was a freer extension of industry and culture during the following century. Men of genius and courage planted industries throughout all Europe. From these small undertakings grew the great plants of the present age, promising to the thrifty and industrious a richer life than they had enjoyed as peasants.

✦ ✦ ✦

DURING that epoch, in Germany especially, after the Franco-Prussian war), was conceived the idea of "perfect economic penetration of the world.", that heresy, which later found expression through Streseman in the slogan —"our future lies in industry". Today we are being forced to revise our ideas as to the feasible range of a people's economic expansion. We learn that it has limits. Exports of commodities cannot rise indefinitely. The strength of a people in the markets of the world depends not merely on its ability through sacrifice to offer goods cheaply, but also on its ability to assume that position of political strength among the world's powers which enables it to protect its colonies, to negotiate commercial treaties with foreign nations, to secure tariff concessions and to empower its diplomats to force to a successful issue all disputes between German commercial travellers and their foreign competitors.

✦ ✦ ✦

THESE few points will serve to show that it is not industrial but political strength which is a people's primary need. Industrial strength is secondary—a mere means of providing for a people a satisfactory standard of living—in other words, work and bread. The duty of the State is to protect the industry of its people, and to encourage its extension by appropriate legislation and negotiation. It is also the duty of the State to establish and maintain a financial system of such character as to render impossible the situation that confronts us today: Industry bleeding to death, a state politically impotent, neither able to control events in the present economic convulsion. Idleness and want are the grinning spectres that dance in the deserted streets of our great industrial cities. While it is true that to a certain extent the reparations question and the world-wide depression which is commonly but entirely erroneously linked with it in the public mind, are partly responsible for our plight, we ourselves must bear the larger share of the guilt, because we have been unable or unwilling to root out from our minds the "liberalism", which belonged to an epoch that we must regard as definitely past.

✦ ✦ ✦

THE fundamental error of the State was in allowing free play to "liberal" economic ideas, particularly in the matter of finance. Industry came under control of an unregulated capitalism which acknowledged no duty to keep the veins of our industrial system supplied with life-blood, but conceived its sole function to be the taking of profit and profit and more profit, through deliberate financing of over-production. Mass-production, "rationalizing", is the logical end.

THE true functions of a nation's industry cannot be to make the people its slaves; its function should be the elevation of the peoples' standards or well being and culture. A people should use its industrial system as a tool, but not let itself be yoked to it. Much is written today of the "curse of the machine". Such is theory of incompetents who cannot chart a course out of the labyrinth of an outmoded industrial epoch into new economic paths. The purpose of this article is to sketch in a few bold strokes causes and effects and to point out the new way. We ask the reader to push up onto his forehead his old spectacles beclouded with the mists of out-worn economic tradition and be prepared to see things as they are today.

✦ ✦ ✦

CAPITAL is the blood stream whose function is to preserve unimpaired through depression such as we are now suffering, and will again suffer, the strength of Industry. It is not the function of capital, nor of those individuals who administer it, to bring Industry into a state of dependence. The means of production should not be so misused, through consolidation and mergers, as to permit the dictation of commodity prices by any individual. Money should be the servant, not the master, of Industry. The prime function of manufactured goods is not to yield high profits through price control; their prime function is to enrich the lives of the people. The world-wide depression and its associated exchange and currency crisis are the result of the misuse of capital. We German manufacturers must not blind ourselves to this fact if we are to share in the work of salvage.

✦ ✦ ✦

CERTAIN groups have learned how to get into their control the gold which belongs to world-industry, and, by price manipulation through their invention, the Stock exchange, exercise a baneful influence. Some countries have recognized this influence, although rather tardily, and have taken measures to check it, notably by abandoning the gold standard. This however, is only a half-measure. So long as money, whether gold standard or paper standard, is not the sole property of the State, but a commodity in private hands, no shifting of standards will work a fundamental change. Money must cease to exist as a commodity which can command a revenue merely through loan, and must resume its proper role as a medium of exchange thus becoming the servant instead of the master of industry.

✦ ✦ ✦

IT is not only in matters of finance that the liberalistic views of a former epoch have played us false. Immaterial as well as material values are involved in the error. Here is a pertinent question. Can a nation in a competitive world-industry afford to export its brains? The answer, especially for us Germans, is NO.

✦ ✦ ✦

TO get down to a specific case. the wire weaving industry. We cannot continue to export, on the one hand woven wire fabrics, on the other hand weaving wire and wire looms. Such procedure makes business for the wire plants and for the shops building wire looms, but will surely kill our highly developed business in wire fabrics out of which the loom building industry had its birth. The wire loom is not an invention; like many other tools it is a development from the most primitive beginnings made step by step by those who served it and who gained their livlihood from it. It is a "brain child" of the German weaver, not the common property of the German branch of the wire fabrics industry. Its destiny should be to make wire fabrics so cheaply in Germany that foreigners would automatically seek their requirements in this market, acknowledging our fabrics to be cheapest and best. The world's demand for wire fabrics is so great that the loom builders also would have their hands full supplying the domestic needs for the weavers could afford to keep their plants up to the minute. At present the weavers cannot spend a cent on new equipment; in fact for the most part they are robbing one loom to repair another, being unable to pay ordinary maintenance and repair costs.

✦ ✦ ✦

NOWADAYS, the fully modern machines are all being exported and the logical result will be that the German wire fabrics industry some day will be fighting at home against imported wire fabrics sold below German cost of manufacture. The export of our "spiritual properties", that is, of machinery for the production of articles of high value, such machinery as should be serving to raise the living standards of the German people, is the natural result of the "liberalistic" view of industry and must absolutely cease.

✦ ✦ ✦

OF course, we may expect to hear the old defense; "If we don't sell the machines somebody else will." In the case of wire looms this is absolutely untrue. What countries build such looms? The United States and France, the latter in a small way only. The management of a certain French wire fabrics plant, having purchased a German loom, was so anxious to keep the German erectors from seeing their plant that the latter were obliged to work inside a wooden partition which was not removed until their job was finished and they had left the plant. This concern builds for its own use certain small high-speed machines, and takes great pains that news of their performance does not reach their German competitors. Conditions are somewhat similar in the United States. It is very difficult to get hold of an American loom which weaves a hard drawn filler. Attempts have been made to copy these looms, but with little success. These two countries are the chief competitors of Germany in wire fabrics in the neutral markets. They refuse to export their brains, that is to say, their wire looms, for they want to protect their fabrics market.

✦ ✦ ✦

WE Germans are proud of the fact that many foreigners come to attend our technical schools and share in our culture, and intellectual achievements, which they hasten to employ in

(*Please turn to page 118*)

Stitching Wire Production

By Hubert

Translated from Draht-Welt, June 18, 1932, By Kenneth B. Lewis
Consulting Wire Mill Engineer

AS its name indicates, this grade of wire is used for stitching, especially in book-binding and in the manufacture of cartons. The wire is produced in various round gauges, and in flats, and is sold bright, coppered, tinned, or galvanized. The size is indicated by gauge numbers. The tabulation shown here gives exact sizes corresponding to the arbitrary numbers of the "book-binder gauge" in both round and flat sizes, in such sizes as are in greatest demand.

SPOOLING

THE finished wire must be spooled. The wire is put onto reels mounted on the spooling machine. The spool is pushed onto a belt driven spindle and secured by a wing-nut. In front of the spool is mounted a combined tension and traverse mechanism. The wire end is secured to the spool and as the spool rotates it pulls the wire through the tension device and lays it into a compact mass. The spool is slotted and after the bundle is formed it can be tied up with 3 to 6 wires and removed from the spool as a compact bundle.

ROUNDS

Number	17	18	19	20	21	22	23	24	25	26	28	30	31
Millimeters	1.20	1.10	1.00	.90	.85	.75	.70	.60	.55	.50	.42	.35	.3C
Approx. inches	.048	.044	.040	.036	.034	.030	.028	.024	.022	.020	.018	.014	.012

FLATS

Number					
Millimeters	0/26	I/25	II/24	III/23	IV/22
Approx. inches	.72 x .28	.72 x .33	.72 x .43	.75 x .55	.88 x .65
Number	2 mm.	3 mm. light	3 mm. heavy	3 mm. extra heavy	
Millimeters	2 x .35	2.6 x 28	2.6 x .35	2.6 x .45	
Approx. inches	.08 x .014	.104 x .0112	.104 x .014	.104 x .018	

Wire Sizes Controlled by Machine Manufacturers

IT is to be noted that the concerns that build the stitching machines specify the wire sizes. For the round stitching wire, and for the rounds from which the flats are to be rolled, basic open-hearth steel is used, and it is drawn by the usual drafting and annealing practice. The finished wire must be exactly round and on size, and must have a good surface, otherwise it will fail to meet the requirements of the stitching machine.

✦ ✦ ✦

Wire for Flattening

WIRE made for flattening into book-binder sizes must be carefully drawn and carefully annealed, otherwise it will develop faults which cannot be corrected and which make it unfit for stitching wire. The following practice is recommended. Open hearth basic rods at No. 6 are pickled in the usual way, rinsed, sulled, limed, baked and drawn in grease to .128. The wire is annealed at this point and drawn to .088. Here it is annealed again and drawn wet to either .064 or .056 and after another anneal is taken to .025.

✦ ✦ ✦

THIS .025 is for flat stitching wire of sizes to be stated below (not included in the above table). It is placed on a reel back of a rolling mill and taken in one pass to either .018 x .030 or .017 x .031. The rolling mill is like those used for cold-rolling flat strip but on account of the nature of the work it is of course of much lighter construction. Roll diameters are 3 to 5 inches and the speed is about 60 to 100 R. P. M. Adjustment is by screws bearing on the upper roll, either by manipulating the 2 screws independently or by means of a geared adjustment worked through a central gear meshing with gears on both spindles.

✦ ✦ ✦

THE wire passes through a guide on the center line. This guide consists of a straightener

(*Please turn to page 121*)

Registry of Used Wire Machinery

Conducted by

Dunscomb Associates

BOX 320, C/O WIRE AND WIRE PRODUCTS
17 EAST 42nd ST., NEW YORK, N. Y.

We Offer—Subject to Prior Sale—The Following Used Wire Mill Machinery

No. 230

Morgan Rod Bench
6-22" Friction Blocks
Gear Drive and Motor
2 Pointers
Block Speeds, 28 to 34 R. P. M.

No. 236

Tinning Frame Complete
20-8" Blocks
Granite Acid Tank
Kettle for Fuel Oil

No. 239

6 Block
Morgan Rod Bench
with Gear Drive
½" Capacity

No. 231

Fifteen Frame for Wet Drawing
10 Blocks 12" Dia.
Block Speed 35 R. P. M.
McMahon Pinions

No. 237

Two Electric Resistance Pointers
O & J Capacity
.148 Wire

No. 240

10 Block Wet Frame
12" Blocks—Capacity .125 Music Wire
Cut Gears and Pinion Clutches

No. 232

Grasshopper Type Crane
Hydraulic 10 Foot Radius
10½" Mast
9" Cylinder

No. 238

Five Round
Acid Vats—66" Diameter

No. 260

Rivet Slitting Machine
Slightly Used

WE HAVE BUYERS FOR THE FOLLOWING

No. 250

Nielson
B2 Power Press
For Making
Flat Wire Pointed Staples

No. 252

One Roller Type Straightener
For Round Wire
Rolls on a Horizontal and Vertical Plane

No. 254

Several No. 1 Waterbury
Cone Machines

No. 251

S & C Machine
¼" or Larger to Cut
36" Lengths—
No Rotary Straightener

No. 253

Straightening and Cutting Machine For
Florist Wire

No. 255

Waterbury Farrel
Wet Drawing Machines
for Solder Wire
2 Rolls—1 to 2 HP

If You Have Used or Surplus Machinery For Sale, Write for Details of our Plan. No Charge For Listing.

APPRAISALS + + + STEEL AND NON-FERROUS + + + INSPECTIONS

+ + +

FOR DETAILS WRITE

Dunscomb Associates

BOX 320, C/O WIRE AND WIRE PRODUCTS 17 EAST 42nd ST., NEW YORK, N. Y.

REGISTRY OF USED WIRE MILL MACHINERY

'Round the World With the Wire Industry

New British Insulating Material

A NEW flexible insulating material has recently been produced by Imperial Chemical Industries, Ltd., the big British chemical combine. It is stated that cellulose ethers, which are insoluble and do not swell in water, are used with plasticizers consisting of aromatic polyethers of polyhydric alcohol, with or without fillers. The resultant product has excellent physical and electrical properties. Other properties of this new material are its non-inflammability, its chemical stability, its impermeability to moisture and high electrical resistivity. It can be used very advantageously for aerial and subterranean electric cables.

✦ ✦ ✦

ANOTHER interesting insulation invention has recently been patented by the Croydon Cable Works, Ltd., London. Breakdowns often occur on overhead lines due to deposits of soot and moisture on the insulators forming a conducting path over the surface of the insulators. This happens very readily on insulators which have deep circumferential channels, as these form effective traps for such deposits. It is proposed in this new cable patent to cover the insulators with what is, in effect, a cylinder of a suitable waterproof insulating material. "Pernax" is cited as a substance whose properties make it suitable for the cover. The covers are fabricated from sheet material and the invention is also extended to cover the use of the construction on any exposed conductor joints.

✦ ✦ ✦

International Steel Cartel Reformed

AFTER much negotiation, the restoration of the International Steel Cartel is now considered as accomplished, although the signing of the agreement will not take place until the international selling offices have been arranged. At the Luxembourg conference on the reconstitution of the cartel unanimous accord was reached on the question of the quantities to be produced by the participating countries. It has been decided that annual exports are not to exceed 6,800,000 tons and that the amount for each participant shall be regulated by a sliding scale.

✦ ✦ ✦

British Seek Withdrawal of Alloy Duties

SHEFFIELD steel makers, who are supporting an application to the Import Duties Advisory Committee for the withdrawal of the tariff on ferro-chrome, ferro-silicon, silico-manganese, and other alloying materials, contend that such materials are obtainable only from foreign sources and that the duties therefore increase the costs of producing steel and steel products.

✦ ✦ ✦

New British Standard Specifications

A GROUP of four standard specifications issued by the British Standards Institution relate to terminal fittings for wire ropes and covers. They cover Bordeaux connections, bull-dog grips, sockets and thimbles respectively. In cases in which strength is the sole consideration minimum dimensions are given, so that manufacturers have scope to improve design, and future development is not precluded. The specification for thimbles provides for three types—ordinary, reeving and solid—and that for sockets two types—open and closed. In the latter case the basket of the socket is identical, modification being made only to that end of the socket which takes a shackle, link, or other attachment.

New Metallurgical Plant for Sheffield University

NEW equipment for the Department of Metallurgy at Sheffield University, where interesting wire research work has taken place in the past, includes plant for the purpose of heat-treatment, which is to consist of two electrically-heated furnaces, the temperatures of which are automatically controlled, one of them being for the purpose of annealing and the other for high-temperature work, such as hardening of high-speed alloys. Both are equipped with a gas curtain within the furnace.

Two large surface-combustion gas furnaces have been ordered, for annealing and high-speed hardening respectively, along with a crucible furnace of the same pattern. Professor J. H. Andrew, head of the department, explains that these, along with the older types at present in the department, will provide a battery of furnaces which will illustrate the differences produced under varying conditions of heating as well as serving for general heat treatment.

✦ ✦ ✦

Improved Method of Insulating Electrical Coils

THE insulation of coils for electrical apparatus is carried out, according to a new patent of the British Thomson-Houston Co., Rugby, by winding around the wire a tape, some three mills thick, of a cellulose ester—for example, cellulose acetate. The complete coil is then heated by passing current through it, by baking or some other suitable means. This shrinks the insulation on to the wires and the whole is formed into a compact body. This method of insulation is claimed to be superior to the more usual methods in that it is cheaper and simpler; the insulating properties are also said to be improved, especially when water is present, and at relatively high temperatures.

'Round the World With the Wire Industry

British Advised to Mark Umbrella Ribs

THE British Merchandise Marks Act Standing Committee, in a report just issued, recommends that an indication of origin should be fixed on imported umbrella ribs, tubes, and frames. The Committee also recommends that an importation order should be made in the case of reinforcement material, but not in respect of wire netting, woven wire, wire, and wire nails and staples, which are already the subject of marking orders.

✦ ✦ ✦

British Develop New Alloys

FURTHER progress in obtaining sounder alloys has been made by the British Non-Ferrous Metals Research Association, and a research into gases in aluminum alloys has been particularly fruitful. In the investigations a method was evolved for the removal of gases from the molten metal by which a stream of nitrogen, with or without chlorine in equal proportions, is passed through the metal at temperatures just above the melting point of the metal. The results led to the development of a method which is applied industrially and examples of which were seen at the Fair. It was found that considerable success resulted from the use of carbon-tetrachloride, titanium-tetrachloride or boron-tetrachloride.

✦ ✦ ✦

IN order to supply the need for a light structural alloy having high tensile strength and good ductility, without the necessity for costly heat treatment, an alloy known as M. G. 7 has been developed. This alloy has the strength of fully heat-treated and aged duralumin and possesses high Corrosion - resisting properties, especially to saline atmosphere and water. It is not susceptible to heat treatment, so that the technique is somewhat different from the heat-treatable alloys. In the annealed condition it is far stronger than annealed duralumin, but it hardens fairly rapidly on the application of cold work, and consequently more frequent annealing is required than for the older alloys. It is obtainable in any of the forms common to duralumin—namely, rods, tubes, wire, etc.

✦ ✦ ✦

MORE recently another light alloy has been developed which is neither so strong as duralumin nor as resistant to corrosion as M. G. 7, but it is much easier and cheaper to work than either. This alloy is known as D2. Its corrosion-resisting properties are adequate for normal conditions and it is claimed to be immune from inter-crystalline corrosion, which has an important influence on the fatigue strength of some alloys. It is obtainable in the same forms as M. G. 7.

✦ ✦ ✦

British Cold Heading Machinery

THE growth of the cold process of manufacturing bolts, screws and rivets, both in steel and non-ferrous metals, has been made possible by the evolution of machinery for cold heading and subsidiary operations. Cold heading machines of modern design were among the exhibits of Greenwood & Batley, Ltd., of Leeds, at the Birmingham section of the British Industries Fair.

These machines were shown in several sizes, to take round wire from ⅛ in. to ⅝ in. diameter. The shape of the head of the finished component decides whether the machine required is to be of single, double, or triple blow, and the length of shank whether of the open or solid die type. It is not as a rule possible to eject a component from a solid die when the length is more than eight to ten times the diameter. When this length is exceeded it is necessary to utilize an open die machine. Examples of automatic screw nicking and inclined thread rolling machines were also displayed by this engineering firm. The latter are designed for the rapid threading of screw blanks and for kindred purposes. They are manufactured both as fully automatic machines with self-contained hopper feed, and as hand-fed machines. Hopper-fed machines are of the inclined type. The blanks are placed in a hopper from which they are automatically fed down an inclined guide-way to a transfer slide, which automatically transfers the blanks one at a time to the threading dies, where they are held until a finger pushes them between the dies.

✦ ✦ ✦

German Distribution Methods

THE distribution of wire products in Germany is entirely different from the distribution in America. The comparison may be of some interest; of 100 tons sold the railroads Germany took in 14.2% (9.5% in America), in 1932, automotive 0.4 Germany (3.1 America), ship building 0.3 (0.2 America), highways 0.2 Germany (2.7 America), buildings 1.7 Germany (4.2 America), hardware, household goods 4.2 Germany (0.6 America), metal furniture 1.1 Germany (3.0 America), containers 11.8 Germany (9.1 America), mining, quarrying 3.7 Germany (5.5 America), oil, gas, water 2.2 Germany (4.3 America), agriculture 1.2 Germany (9.2 America), machinery 7.2 Germany (3.7 America), bolts, rivets, etc., 2.2 Germany (3.0 America), containers manufactures 2.1 Germany (0.8 America), exports 37.2 Germany (20.1 America). The rest was taken by jobbers, warehouses and miscellaneous products.

(*Please turn to page 124*)

Save on Your
Winding Costs
With Winco Products FOUR-X Enameled Wire

▲ ▲ ▲ All wire meets the most exacting requirements ▲ ▲ ▲

Winco Products 4X Enameled Wire has been developed to replace single silk covered and single silk over enameled wire in the winding of small motor armatures, fans, high frequency radio transformer coils and other apparatus where high insulation values and ability to resist abrasion, are prime factors.

▲ ▲ ▲

Winco Products 4X Enameled Wire is covered to the same dimensions as the fabric covered wires, and can therefore be wound without changes in armature slots, bobbins or winding jigs.

▲ ▲ ▲

Is superior in its ability to withstand high temperatures.

▲ ▲ ▲

Will withstand softening in the varnish dipping and baking operations.

▲ ▲ ▲

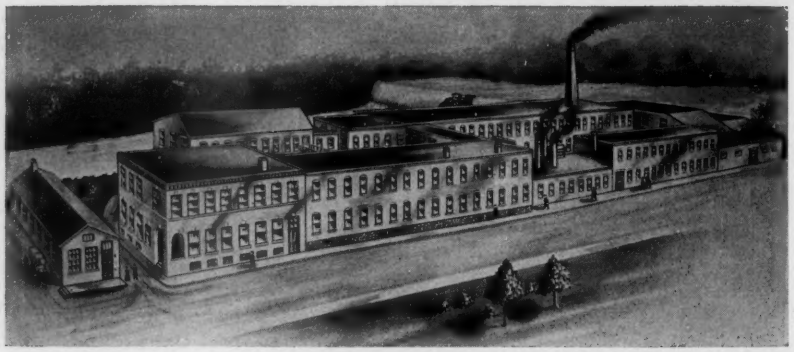
Requires little or no change in winding practice.

▲ ▲ ▲

Costs substantially less than the silk covered wire.

▲ ▲ ▲

Write for samples.



GENERAL VIEW OF PLANT, WINSTED, CONN. ▲ ▲ ▲

Products of leakage currents attack insulation and shorten the life of the coil. ▲ ▲

The only test indicating what the leakage loss in a winding may be is the test in mercury, which reveals the weak spots in the enamel covering. ▲ ▲ ▲

Our method of testing all wire by mercury test before shipment is calculated to give the user the highest degree of protection. ▲ ▲ ▲

ALL Winco Products WIRE

GUARANTEED LEAK PROOF ▲ ▲ ▲

We would be pleased to quote on your requirements.

WINSTED INSULATED WIRE COMPANY

Incorporated

Winsted, Connecticut

"HUDCO" PRODUCTS...

Specially Processed Copper Wire...

For Enameling Purposes...

▲ ▲ ▲ Electrolytic and Oxygen Free ▲ ▲ ▲

AERIAL VIEW OF PLANT OF HUDSON WIRE CO., OSSINING, N. Y. ▲ ▲ ▲
▼ ▼ ▼ FINE WIRE MANUFACTURERS ▼ ▼ ▼

"HUDCO" High Conductivity Electric Wire

OTHER FINE BARE WIRES

High Brass, Low Brass, Zinc 99.99+ and High Tensile Zinc, Commercial Bronze Phosphor Bronze, Pure Tin, Lead, Antimonial Lead, Cadmium, 10%, 18% and 30% Nickel Silver, Silver Plated Copper, False Gold and Special Brass and Bronze Alloys to Specification.

BRUSH WIRES, CRIMP and STRAIGHT

Brass, Steel, Nickel Silver, Copper and Phosphor Bronze

TINSEL LAHNS

Silver Plated Copper, False Gold and Copper

METALLIC FIBRE FOR PACKING PURPOSES

Copper, Bronze, Zinc, Lead and Aluminum

Wires for Metal Sprays

Zinc, Tin, Lead, Copper, Commercial Bronze, High Brass, Low Brass, Cadmium, 10% Nickel Silver, 18% Nickel Silver, Aluminum, Monel Metal, Phosphor Bronze, Pure Nickel. Other wires to specification.

"Hudco" copper wire is drawn by the Hudson Wire Company of Ossining, N. Y., who have been specialists in the manufacture of fine wires for over thirty years. ▲

The best grade of copper drawing stock is used, insuring the maximum conductivity. ▲ ▲ ▲

A new process of drawing and annealing is used which produces a wire unusually smooth, clean and uniform in color for enameling and other purposes. ▲ ▲ ▲

Painstaking care in the selection and maintenance of dies guarantees a product accurate to gauge and resistance. ▲ ▲ ▲

You can rely on "Hudco" wire always. ▲ ▲ ▲

Expert annealing of the wire prevents unnecessary breakage when winding the wire into coils ▲ ▲ ▲

If you, too, have a specific problem demanding wire of exact requirements, write to us about it. ▲ ▲ ▲

It costs nothing and involves you in nothing. ▲ ▲ ▲

Better wire at lower cost. ▲ ▲ ▲

We can serve you quickly and economically.
Send in your specifications for a quotation.

"HUDCO" FINE WIRES

HUDSON WIRE COMPANY

Ossining, N. Y.

"HUDCO" FINE WIRES

Estab. 1902 — Successors ROYLE & AKIN — Estab. 1902

Wire Association Questions and Answers

Question No. 1450--Experiments in substitute for sull coat in stainless.

The Wire Association
17 42nd Street
New York, New York

"We are doing some experimenting on stainless steel wire as it has been called to our attention that this is a very difficult material to draw. As a matter of fact, last week a statement was made to us that no one knows anything about drawing it, and that practically all mills that are doing this type of drawing are having difficulty.

As you probably know, the sullcoat that is formed on regular steel wire serves as a partial lubricant and as a binder for the lubricant now being used in drawing regular steel wire.

On stainless steel, it is impossible to form a sull coat. Therefore, you have lost a lubricant, and also, you have no binder for any other lubricant.

We have just discovered something that we feel will do the work of a sull coat, it being in the form of chemically treating the wire.

I would appreciate it very much if you would have some member of the association send me some stainless steel wire. I would like to have some that is in the process of being drawn and also some that it in the rod after it is cleaned, lime coated, and baked. Would also like to obtain the rod as it comes to the mill before it is cleaned and treated for drawing.

We believe that this will be one of the outstanding accomplishments for this end of the wire industry, and any help that you can pass along at this time will be appreciated."

Correspondence is invited on the above. Address Secretary, The Wire Association, 17 E. 42nd St., New York, N. Y., for further details.

Question No. 1424--Please let us have information on all types of lubricants used on different types of wire.

Answer No. 1

The Wire Association,
17 East 42nd Street,
New York, N. Y.
Gentlemen:

"In reply to your letter of February 10th, you have, probably without realizing it, asked us four somewhat difficult questions. However, I will do my very best to answer them, and hope they will be of some benefit to you in your work.

1. Type of lubricants used on different types of wire.

On drawing steel wire, there are 3 distinct ways that it may be drawn; namely, through powdered soaps which is called dry drawing; through a solution of soap called liquor finish or wet drawing, and cold drawing, or wire that is drawn through grease. In dry drawing it is my opinion that an 88% Anhydrous powdered soap made from tallow is used in large quantities, although there are other fats such as Palm Oil, and a combination of Palm Oil and Tallow soaps used in this type of drawing. In some cases a soap with as low a content as 70% actual soap is used. The titre of a soap plays some part in choosing the correct lubricant in dry drawing. Low carbon wire does not require as high a titre soap as high carbon. We have found it quite important, however, that there should be very little moisture present in powdered soaps for dry drawing. Some mills insist on their soaps being of the greasy type while others prefer their lubricant to be very dry and powdery.

In reference to wet drawing, this is a little more difficult for us to answer. Lubricants for this purpose are more in the form of a compound wherein they embody certain lubricating and cleansing properties. There is very little we can say about the type of soap used for this purpose, as it would more or less divulge the structure and analysis. We might say this, however, they must be readily soluble in water, and the dies should not be permitted to suck up. Also it should not be too much on the alkali side as this would have a tendency to break the wire. These compounds are usually in paste form and contain a moisture content running from 20% to 40%, depending wholly upon the type of wire to be drawn. Low carbon steel wire drawn liquor finish will take an entirely different compound than high carbon. I find that the percentage of steel wire drawn through grease is very small, and would say that the ordinary Cup Grease serves this purpose very well. However, there is considerable experimenting going on perfecting new greases for this purpose.

2. Approximate quantity of oils and soaps used as lubricants in wire drawing.

I would say that the amount of soaps used by all wire mills throughout the country, including of course, the drawing of brass, copper and bronze is extremely large. Although, today the consumption of soaps by the metal industries is probably down to 20 or 25% of what it was. Powdered soaps for dry drawing are sold in the largest quantities. In normal times some mills would purchase this material in car-load lots, whereas today some of our largest wire mills are only purchasing 5 barrels a month, which is considered good business.

3. What are the qualities of a good soap lubricant?

In answer to this, I might refer you to page 11 in January's issue of your magazine, and to the paragraph entitled "Good Lubricant Qualities". Mr. Longwell has done an excellent job in answering this question, and it leads us to believe that the future wire-drawing lubricant will not necessarily be a soap.

4. What are the qualities of a good oil lubricant?

Would say that there is very little oil used as a lubricant in the wire drawing industry. The only part that oil plays in the wire drawing industry as far as I have been able to determine, is in the capacity of a quenching oil, which I believe is a straight Paraffine Oil sold by the refiners.

The copper and brass industry still use a considerable quantity of Lard Oil.

I hope that I have covered these questions satisfactorily and that they will be of some help to you. If we can be of any further assistance to you, please do not fail to call upon us."

✦ ✦ ✦

Answer No. 2

The Wire Association,
17 East 42nd St.,
New York, N. Y.
Dear Sirs:

"Replying to your letter I give below information in order to your questions:

1. Type of lubricants as follows: For fence wire and other low carbon wire where size and finish is not of first importance, most mills use either a vegetable or an animal grease, although some use soap powder made from a grease base.

For other low carbon use most mills use a low titre powdered soap made either from grease base or a mixture of grease and tallow.

For high carbon wire a high titre soap powder made from 41°to 43° titre tallow is preferred, although some mills use soap powder made from vegetable oil such as Palm Oil or Olive Oil. Most of the soap powders that we make from Palm Oil base or Olive Oil base, go to wire rope people like Roebling.

On copper rods and tubes the wet drawing solution is usually made from tallow soap which is supplied solid in barrels and which is made into varying solutions in the mills. In some few cases whale oil and fish oil soap, usually in cubes is called for which is used appparently for special jobs.

2. As far as the approximate quantities used, the only real test that I have ever seen made used on an average of 1½ pounds to 3 pounds of soap powder per ton of wire drawn and, of course, this amount will vary under different conditions depending on the kind of dies, amount of reduction, finish required, speed, etc.

3. The chief qualities of good soap lubricants are, first that it must be a

Wire Association Questions and Answers

pure soap. As the addition of fillers such as silicate and soda ash, etc., tends to cut down the efficiency just that much. The second is that the powder should be dry.

4. As far as oil lubricants are concerned, I do not know a thing about them inasmuch as I have only seen one mill where they used wet drawing with oil lubricants entirely.

The only other point that I have not mentioned is the drawing of aluminum wire, which is also covered in my article. Here they use a good grade tallow about the same grade as we use in making toilet soap base.

If there are any other questions on your mind, let me know."

✦ ✦ ✦

Question No. 1521--1. What is the basis of lubricant binder which replaces the sull coat on stainless? 2. At what sizes does the wet drawing process start?

Answer No. 1

"It is common practice, generally speaking, to start wet drawing at approximately No. 22. In some cases it may start with larger sizes. Opinion at this time is hardly crystallized sufficiently to outline the different practices."

Answer No. 2

"I have your letter regarding a drawing lubricant for stainless steel wire. I am not surprised that your correspondent wants to know how to replace the sull coat. Everybody wants to know just that. The sull coat seems to be the only safe way to lock the lubricant to the metal.

I can't tell him what he wants to know, but I can perhaps predict where it may be successfully sought. Die wear is probably a form of cold welding, in the course of which the 2 metals in contact pull pieces out of each other. The logical base for a film would contain some substance that interferes with welding. Sulfonated or chlorinated oils seem indicated, or the metallic salts of the fatty acids.

As for wet drawing, I don't know that there is any uniformity of practice. There is another problem here, how to plate a metal onto a non-corrosive base. Copper can be put on in very small amounts with great difficulty.

Answer No. 3

1. We usually use copper to replace the sull coat.
2. We have no fixed size at which we start the wet drawing process. We use the same process as in drawing ordinary steel wire.

Answer No. 4

1. We use copper coat for lubricant.
2. We start the wet drawing process at about .025.

Answer No. 5

Replying to your letter, I have nothing whatever to offer as we have found it almost impossible to gather any definite and accurate information regarding the preparation of stainless wire, and the lubricants which have proved to be most satisfactory. If, in response to this letter, you gather in some pertinent information, I would certainly appreciate having a copy of it.

The Wire Association is for the specific purpose of improving production methods. It was organized as a clearing house of ideas on technical problems and research work in all phases of practical wire drawing and wire working.

The following inquiries were received from and answered by members of the Wire Association. These inquiries are sent to the Secretary of the Association who acts as a central clearing point, and neither the names of the firms or individuals sending in the inquiry, or of the men or firms replying are divulged without permission.

Join the Wire Association!

✦ ✦ ✦

Question No. 1225--Information wanted on the manufacture of steel wire rotary brushes.

The Wire Association:
17 East 42nd Street
New York, N. Y.
Dear Sirs:

"I am trying to get some information pertaining to the manufacture of steel wire wheel rotary brushes. Perhaps you can give me a bibliography of books on the subject of the manufacture of wire wheel brushes. I examined the card files at the Omaha public library for books or bulletins and industrial arts index for information describing how steel wire wheel rotary brushes are made but found very little material on this subject."

Answer No. 1

"In such cases as yours it is safe to say that the organization of the industry in this country makes the job especially hard. Manufacture of rotary wire brushes is probably introduced by an employee from another plant where brushes were made, and the procedure is doubtless to have him make sketches of the machines with which he has worked, introducing such improvements as may have occurred to his mind. Machines are then built by some small jobbing machine shop, and probably altered after they are put into service. It is doubtful whether any machine shop, having built such machines, ever had the luck to find another buyer.

That is the usual course of development in this country for the small wire specialties. Only when the business assumes large proportions do we find special machines advertised or in any way made available to the trade. This is true even of such machines as wire cloth looms and wire netting machines.

Now regarding your present problem, there are two ways to get started. First, you can pick up a good mechanic from some plant now making these brushes, and have him get you tooled up. Second, you, or someone acting for you, can get into a plant, find out who made the machines, and whether he has sketches and information and can develop a line of suitable machines and fixtures for you."

✦ ✦ ✦

Question No. 1510--May we trouble you to tell us the relative merits of Bessemer and Basic Steel Wire with respect particularly to tensile strength, ductility, elasticity, durability, etc.

About what is percentage of carbon in both Bessemer and Basic Wire.

Answer No. 1

"Replying to your letter I must of course begin by saying that the composition of either basic or bessemer steel is subject to wide variations which affect the physical properties. Your question, however, doubtless refers to such steel as would be supplied for wire manufacture without any other specification than "basic" or "bessemer", and can be answered on that basis.

The tensile strength of bessemer is distinctly higher, and the elastic limit and yield point are higher in relation to the tensile. This is partly due to the generally high carbon, bessemer usually running .10 to .14 and basic .06 to .12. It is due also to a much higher amount of phosphorus in bessemer, and perhaps to the presence of larger amounts of elements not usually determined by analysis, such as dissolved oxides and nitrides resulting from the air blast.

Ductility is a term hard to define, but bessemer steel, though harder, draws very nicely into wire. Basic will generally stand more drafts without annealing.

Bessemer cleans more quickly and satisfactorily in acid. It also draws better into fine wires such as are drawn wet with a copper coat. This is a noticeable feature of bessemer, and seems to be due to a surface condition which is perhaps attributable to phosphorus, and which in any event causes the copper coat to adhere more surely and draw more smoothly.

Basic steel is often manipulated in composition to simulate bessemer in behavior, but these "bessemer substitutes", which generaly run .18 to .20 carbon, never quite equal bessemer in the ease with which they can be worked into fine wire."

A Review of Recent Wire Patents

No. 1,892,120, AUTOMATIC MACHINERY FOR MAKING FISHHOOKS, Patented December 27, 1932 by Mathias Topp, of Gjovik, Norway, assignor to O. Mustad & Son, of Oslo, Norway, a company of Norway.

Particularly, this invention relates to a transporter device employed in the manufacture of fishhooks and is described as an improvement upon the inventor's prior U. S. patent 1,691,543, dated November 13, 1928. In the present invention, the transporter device is simplified so that the same as a whole has only a horizontal reciprocating movement, whereas the holders for the wire carried by the transporter are given a necessary vertical or nearly vertical movement independently of the transporter body.

✦ ✦ ✦

No. 1,892,632, MANUFACTURE OF DEAD LAY WIRE ROPE, Patented December 27, 1932 by Albert S. Rairden of Hamden, Connecticut.

The machine embodies a central hollow shaft thru which the core is adapted to be passed with a plurality of strand spools carried by and rotatable with the shaft. A twisted head is secured at one end to the shaft with a combined guide and bending ring secured to the shaft at a point slightly below the head, the ring being of materially less diameter than the head. The die is mounted adjustably above the head. It is stated that the manufacture of this particular wire rope may be carried out on standard vertical rope laying machines by making slight changes in the twister head of the machine.

✦ ✦ ✦

No. 1,892,502, WIRE COIL FORMING MEANS, Patented December 27, 1932, by Gorman C. Burd and Otto Bratz of Adrian, Michigan, assignors to American Cable Company, Inc., a Corporation of Delaware.

An object of the invention is to provide dies for deforming a cylindrical coil of wire spring structure such as to import to at least a portion thereof a contour of progressively diminishing radius, the dies having internal arcuate forming surfaces provided with arcuate grooves so disposed as to constitute a substantially continuous helical groove of progressively diminishing radius when the dies are assembled in cooperative position.

✦ ✦ ✦

No. 1,895,605, METHOD OF PRODUCING SEAMS IN WIRE FABRICS, Patented January 31, 1933 by William Eugene Buchanan of Appleton, Wisconsin, assignor to Appleton Wire Works, Inc., of Appleton, Wisconsin, a Corporation of Wisconsin.

The method consists in interposing a strand containing fusible metal between spaced edges of the fabric parts to be joined, pressing the edge faces of the fabric parts against the respective opposite sides of the strand and melting the fusible metal of the strand to unite the edges of the fabric parts while the fabric edges are pressed towards each other.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 17 East 42nd St., New York.

No. 1,895,898, FLAMEPROOF CABLE, Patented January 31, 1933 by William C. Robinson of Sewickley, Pennsylvania, assignor to National Electric Products Corporation of New York, N. Y., a Corporation of Delaware.

The cable is provided with a light colored braided covering impregnated with silicate of soda to provide fire-retarding characteristics thereto and to also provide a transparent coating through which the light color of the braid may be visible, the cable also having, as the outermost coating thereof, an outer surface of transparent wax-like material through which the light color of the braid is visible.

✦ ✦ ✦

No. 1,895,927, RUBBER INSULATED ELECTRICAL CABLE, Patented January 31, 1933 by Clifford O. Hull of Stratford, Connecticut, assignor to General Electric Company, a Corporation of New York.

The method in this patent, of manufacturing rubber covered multi-conductor cable which consists in assembling the conductors and a filler, providing a paper separator thereon, applying a jacket of uncured rubber over the separator and then vulcanizing the rubber jacket. It is claimed that this method will not require the use of a mold or lead sheath during the vulcanization of the jacket.

✦ ✦ ✦

No. 1,896,040, INSULATED WIRE AND PROCESS THEREFOR, Patented January 31, 1933 by Samuel Ruben of New Rochelle, New York, assignor to Vega Manufacturing Corporation, of Wilmington, Delaware, a Corporation of Delaware.

The inventor aims to provide a wire having a flexible water-proof insulation, capable of withstanding high temperature and abrasion without injury. He provides a closely adherent layer of a flexible refractory insulation for the wire, consisting substantially of finely divided chromium, titanium or iron oxide held upon the wire by a baked water-insoluble resinous binder to which may be added boric acid.

✦ ✦ ✦

No. 1,896,043, INSULATED WIRE AND PROCESS THEREFOR, Patented January 31, 1933 by Samuel Ruben of New Rochelle, New York, assignor to Vega Manufacturing Corporation of Wilmington, Delaware, a Corporation of Delaware.

The object of this invention is similar to the last above and in this patent, a fused layer of antimony oxide is placed upon the wire and a coating of finely divided insulating material held together upon the wire by an organic binder effective at relatively low temperatures and an inorganic binder capable of standing a red heat. The first named binder is comprised of shellac, Venice turpentine and alcohol, and a second binder of boric acid.

✦ ✦ ✦

No. 1,895,175. PROTECTIVE COATING AND METHOD OF PRODUCING THE SAME, Patented January 24, 1933 by Horace A. Staples of Plainfield, New Jersey, assignor to National Electric Products Corporation of New York, N. Y., a Corporation of Delaware.

Particularly, the invention relates to a protecting coating for non-ferrous materials such as brass or other alloys containing copper. The method includes the step of adding an oxidizing accelerating agent comprising kerosene to the drawing compound for accelerating the oxidation of the material, and the step of subsequently, after drawing, effecting oxidation by heating the article in the presence of an excess of an oxygen.

✦ ✦ ✦

No. 1.895,176, PROTECTIVE COATING AND METHOD OF PRODUCING THE SAME, Patented January 24, 1933 by John A. Staples of Plainfield, New Jersey, assignor to National Electric Products Corporation of New York, N. Y., a Corporation of Delaware.

This invention has practically the same object as the last above, the method comprising creating the coating in part by the oxidation of the surface of the alloy itself and in part by forcing into the surface to be oxidized the substance comprising copper carbonate, and therefore converting the copper carbonate into oxide form which joins and merges with oxide formed from and upon the surface of the alloy itself.

✦ ✦ ✦

No. 1,895,320, MATERIAL FOR AND PROCESS OF COATING METAL, Patented January 24, 1933 by James H. Gravell of Elkins Park, Pennsylvania, Company of Ambler, Pennsylvania, a assignor to American Chemical Paint Corporation of Delaware.

The invention relates to a material for and a process of coating metal so as to prevent corrosion and to enhance the appearance thereof. The material comprises an admixture of kerosene, stearine pitch and also orthophosphoric acid.

✦ ✦ ✦

No. 1,896,661, WIRE FEEDING DEVICE FOR STAPLING MACHINES, Patented February 7, 1933, by George E. Breece of Albuquerque, New Mexico.

The invention relates to a stapling machine, such as used for stapling crates and the like and in which wire from coils is fed to the machine and forms the staple. Features of the invention is in the feeding of the stapling wire and comprises an arrangement for periodically gripping the wire and feeding it forwardly and at about the same time giving a rocking motion to guide tubes carrying the wire, the feed of the wire being synchronized with part of the machine for forming the staples and driving them.

Exports and Imports of Wire

Exports of iron and steel wire products in Dec., 1932 and Jan., 1933
(In gross tons)

	January 1933	December 1932	January 1932
Wire rods	711	1,103	1,108
Hoops, bands and strip steel	944	892	1,863
Plain black or galvanized iron or steel wire	390	731	698
Barbed wire and woven wire fencing	892	1,348	1,478
Woven wire screen cloth	40	43	42
Wire rope	107	123	155
Insulated iron or steel wire and cable	....	2	12
Other wire and manufactures	173	194	187
Wire nails	601	701	1,202
Tacks	30	41	32
Other nails, including staples	121	270	219
Bolts, machine screws, nuts, rivets and washers	185	307	225
Total, these 12 classifications	4,194	5,755	7,221

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Concrete reinforcement bars	266	905	3,428
Hollow bars and drill steel	84	73	53
Merchant steel bars	1,664	1,711	3,817
Wire rods	1,196	1,149	986
Barbed wire	1,717	521	1,325
Round iron and steel wire	155	105	147
Telephone and telegraph wire	16	3	2
Flat wire and strip steel	65	91	71
Wire rope and strand	127	146	139
Other wire	225	123	84
Hoops and bands	1,445	1,777	2,034
Nails, tacks and staples	1,007	1,051	800
Bolts, nuts and rivets	20	26	18
Total, these 13 classifications	7,987	15,668	28,572

EXPORTS of iron and steel products from the United States reached a total of 56,720 gross tons in January, 1933, to set the highest monthly figure attained since May, 1932, and exceeding the trade of any other month of last year with the exception of April. Imports in dropping to 20,892 tons ran the current downward movement of this trade into its second consecutive month.

✦ ✦ ✦

STRONG gains in exports of 3 classes of products were registered. Exports of heavy rails—2,315 tons—exceeded the December figure by 2,048 tons, the trade in scrap rose 1,665 tons, and export shipments of galvanized steel sheets increased 942 tons.

✦ ✦ ✦

JAPAN purchased in all 24,662 tons of iron and steel goods of which 22,614 tons was scrap, 1,002 tons tin plate, and 684 tons wire rods. Italy, purchased 7,563 tons of scrap, while Canada was third in volume of purchases. with a total of 4,626 tons in which was included 914 tons of scrap, 635 tons of steel bars, 593 tons of hoops, and 542 tons of black steel sheets.

WITH a loss in volume amounting to 7,498 tons the import trade continued its December decline through January with the resulting total only 21,892 tons. The month's chief decrease was that in pig iron—7,800 tons.

✦ ✦ ✦

GAINS of 2,557 tons of the imports of ferro-manganese and of 1,196 tons in barbed wire were registered.

✦ ✦ ✦

BELGIUM was the month's chief source of supply—her total of 5,508 tons including such items as 1,263 tons of merchant steel bars, 1,351 tons of structural shapes, 961 tons of sheets, and 681 tons of hoops and bands. The German total of 3,996 tons embraced 1,565 tons of barbed wire. 893 tons of nails, and 456 tons of wire rods.

✦ ✦ ✦

CARD clothing imports suffered a further decline—to 8,273 square feet valued at $6,687, all of which came from the United Kingdom.

WIRE cloth and screening imports, however, were 2½ times as large at 16,846 square feet, and included 7,830 square feet received from France, 6,156 square feet from Germany, and 2,860 square feet from Canada.

✦ ✦ ✦

FOURDRINIER wire receipts were also considerably greater in January, totaling 82,082 square feet and including 51,650 square feet from Germany, 12,775 square feet from France, 8.782 square feet from Austria, and 7,-629 square feet from Sweden.

✦ ✦ ✦

IMPORTS of wire fencing and netting were much larger in January than in December—that galvanized before weaving totaling 5,480,431 square feet of which 3,-555,127 square feet arrived from Germany, 1,620,304 square feet from Belgium, and 305,000 square feet from the Netherlands.

✦ ✦ ✦

OF the fencing and netting galvanized after weaving — a total of 3,891,400 square feet—3,-058,350 square feet came from Germany, 656,400 square feet from the Netherlands, and 104,650 square feet from Belgium.

✦ ✦ ✦

WIRE heddle receipts rose to 2,176,000 pieces of which France supplied 1,896,000, Germany 263,000 and Switzerland the balance.

✦ ✦ ✦

IMPORTS of wood screws totaled 3701 gross. Value $382. Of these the Netherlands shipped 2450 gross, Belgium 1250 gross and Czechoslovakia 1 gross, value $5,103.

✦ ✦ ✦

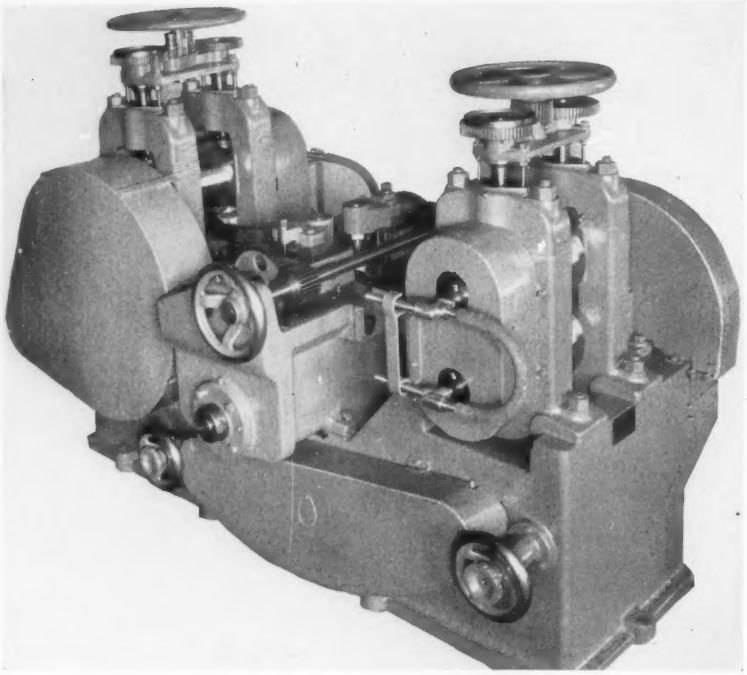
EXPORTS of iron and steel wood screws totaled 26,121 gross while those of brass wood screws totaled 3293 gross, value $984.

✦ ✦ ✦

OF the total of iron and steel wood screws, 8350 gross went to the Philippines, 5883 gross to the United Kingdom, 3666 gross to Cuba, 2271 gross to Brazil, 1197 gross to Canada, and 1138 gross to Venezuela.

Brass wood screws were exported principally to the same countries.

Flat Wire Rolling Mill



10″ Breakdown—5″ Edging—8″ Finishing Rolls Driven by 40/50 h. p. 3 to 1 Variable Speed Motor. Capacity 150 to 450 ft. per minute. Wire Straightening rolls, scarfing attachment, guides between rolls and Take-up strand to suit customer's needs.

WE BUILD

Rod Blocks—Inverted Type

Chain Draw Benches—Multiple Coil Winders.

Flat Wire Rolling Mills—Rod Pointers.

Hollow Wire Straighteners and Equipment.

Multiple Strand Bright Annealing Units.

Stranders to Customers' Specifications.

Reelers and Spoolers for all sizes of Wire and Cable.

Reelers and Spoolers for Tinning, Galvanizing,

Patenting and Annealing.

Designer and Builder of Special Machinery

Frederick M. Conran

Designer of Special Machinery for Rod, Wire, Tube, Strip and Cable.

107 Colden Street Newark, N. J.

Lime and Tub Practice

(*Continued from page 105*)

of lime. This should be done to insure good practice. I am not a general chemist, and am interested only in things pertaining to my trade, but I test as follows and find it pays. 11.5c.c. Nitric Acid, 1.42 Sp. Gr. is made up to 100C.C. of water. 1C.C of this solution will equal 1% of lime when used with 5C.C. taken from lime tub and mixed with 100 C.C. cold water. Add 5 drops Methal Orange and stir with glass rod while H,NO_3 is being added from burrett until yellow color changes to red. (1 c.c. equals 1% lime).

✦ ✦ ✦

The German Wire Weaving Industry

(*Continued from page 107*)

competition with us from their home-lands. That too is exporting our brains.

✦ ✦ ✦

WE Germans are now shipping our wire looms all over the world, so that in countries where the demand is considerable, local industries in wire fabrics are already established which are gradually making these countries independent of us. To lighten their task still further **we are exporting weaving wire to them at prices far below the prices quoted domestic consumers.** The wire loom is today refined to such a degree that it is no longer necessary for a weaver to serve an apprenticeship of many years before he can tend a loom. The operator now does not have to be of so high a grade of intelligence as was necessary here up to a short time ago. Thus many countries which used to be our good customers are now actually our competitors. Argentine, Brazil, Chile, and South Africa are already weaving the greater part of their requirements. Italy, Roumania, Austria Belgium, Denmark, Norway, Sweden, England, Jugo-Slavia, Spain, Poland, Russia and Japan have established wire weaving industries with German looms, and protect them with high tariffs.

These countries are slipping further and further from our grasp —in fact to a certain extent they are competing with us in the neutral markets.

✦ ✦ ✦

THE German wire fabrics industry, weakened by the lean years we are passing through, can scarcely hope to carry on the fight much longer. If today some enterprising merchant in India should take it into his head to establish the industry there, the blow would be a heavy one—perhaps the heaviest we have had. Under present conditions the foreigner gets German looms with the very latest improvements, and moreover we supply him very cheap wire. The day cannot be far distant when the great house of Stalin & Co., will step into the export field as our competitor,—again with German looms. Then will our technical skill and our inventive ability work as a curse upon us, and rightly so, for we have squandered them. And with a proper relationship of State to people our outstanding talents should be a blessing to us.

✦ ✦ ✦

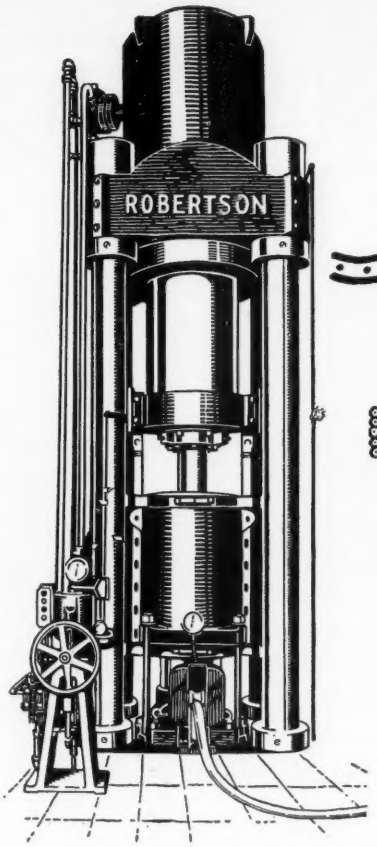
ARE we not contributing more and more to the circumstances that are closing the world's markets to us? How long in such conditions, can the wire fabrics industry remain a competitor?

✦ ✦ ✦

MUCH can still be saved but prompt and concerted action is necessary, and it must be directed to the right spot. The export of German wire looms must be prohibited. German weaving wire must no longer be sold abroad at prices below those quoted German weavers.

✦ ✦ ✦

THE war waged by our neighbors against German culture and its offspring, a highly developed industrial structure, did not end victoriously in 1918, but was merely carried on with other weapons. A world-wide economic crisis was kindled, and currency and exchange crises, in the hope that a weakened German industry would fall a victim. Through the aid of the stock exchanges prices of all over-seas products have been so depressed that the over-seas produc-



LEAD ENCASING PRESSES

which are Internationally Known

Note: Robertson makes all types of lead-encasing machinery required by rubber hose and electrical cable makers: Extrusion Presses, Hydraulic Pumps, Melting Furnaces and Pots, Dies and Cores, also Lead Sheath Stripping Machines, and Hydro-pneumatic Accumulators.

Robertson lead encasing equipment is virtually a standard thing here and abroad, where in many cases it is used exclusively.

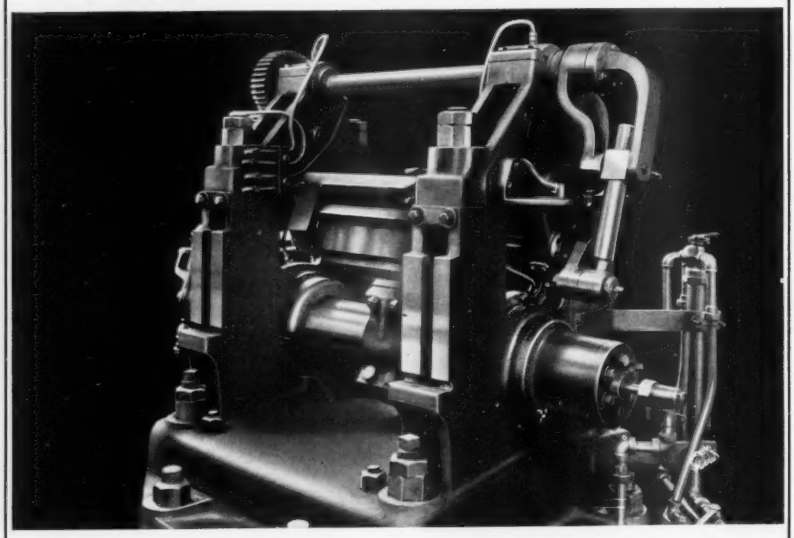
Robertson lead - encasing presses may be used for extruding lead sheath directly onto electrical wires and cables, from ¼" to 5" outside diameter, and also for lead-encasing bare metal wires, rods, and tubes. They are built for hydraulic capacities from 650 to 2500 tons,—and are used "exclusively" in many plants here and abroad. In fact, they're practically "standard equipment."

Upon request, we would be pleased to have one of our Engineers call, or to send you literature . . . without obligation.

John ROBERTSON CO. INC. Pioneers-Since 1858

125-137 Water Street Brooklyn, N. Y

FLYING SHEAR
by LEWIS



FOR ROD MILLS, BAR MILLS AND STRIP MILLS

Either Steam, Air or Electrically Driven. We will be glad to send you complete data on this thoroughly modern and efficient shear.

LEWIS MAKES A COMPLETE LINE OF ROLLING MILL MACHINERY INCLUDING:

Mill drives up to and including 6,000 HP. Shape Straightener Machines up to and including 24 inch I beam. Motor operated Screw-Down for Mill. High Speed Gear Sets for Continuous Rod Mills. Continuous Bar and Billet Mills. Cold Mills for Sheet and Strip. Rail Breakers. Rail Re-Rolling Mills. Universal Mill Spindles. Chilled Iron and Iron Alloy Rolls for Iron, Steel, Brass, Copper, Aluminum, Zinc and Nickel. For hot Sheets, tin plate and strip---for cold sheets, tin plate and strip. For merchant bars and rods, Shears--Vertical Alligator--Cropping--Plate and Squaring. Special Machinery--Testing Machines and Iron and Steel Castings.

THE LEWIS FOUNDRY & MACHINE CO.
BOX 1591
PITTSBURGH, PA.

er can no longer get back his costs, the result being unemployment and a lowered purchasing power. The value of coffee warrants is so low that the planters dump their coffee into the sea rather than sell. As a natural consequence we can dispose of our goods, if indeed at any price, at a price which does not net us cost. Many countries, as a result of these conditions have passed through financial panics, for their industries are at a standstill, and their banks, as with us, belong not to the state, but to private international bankers, who have power to manipulate exchange rates at their pleasure.

✦ ✦ ✦

THESE crises are not the result of the interplay of uncontrollable economic forces, as the masses are asked to believe, but are the weapons of a comparatively small group of men. Their object is, with the help of "liberal" thought, to bring into their power the laboring masses of the world, and especially those of the best organized and equipped workshop of the world, GERMANY, and to divert the fruit of our industry into their own pockets. We may sacrifice and sacrifice endlessly—it will all be in vain, until we come to our senses, place our industrial system on an entirely now basis and become, in industrial matters, nationally minded.

✦ ✦ ✦

IT is the duty of the State and its leaders to see this matter clearly and to take the necessary remedial steps.

✦ ✦ ✦

IN the course of an article of this character and details must necessarily be sketched in with rather broad strokes, and cannot always be made clear to a busy reader but the interest of labor and management alike are bound up with the strength and well being of our industrial structure.

It is this community of interest that has inspired this article.

Wire and Wire Products, Buyers' Guide and Year Book of the Wire Association

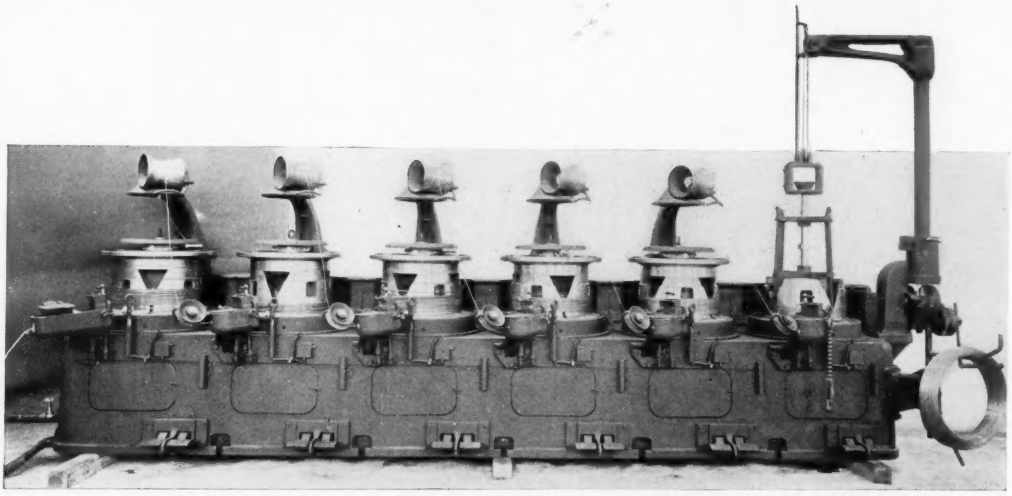
1933 Edition

LIMITED EDITION

$5.00 per COPY

Place Your Order Now!

The KRATOS NON-SLIP CONTINUOUS WIRE MACHINE



Model E A-1 for six drafts
From No. 3 Rod to 16½ AS&W gauge in one operation.

✦ ✦ ✦

These Machines, which, Together with Corresponding Models for Intermediate and Finest Sizes, Embody the Practical Experience of Twenty Years, are Now Built in the United States.

For Details and Prices Address

Kratos-werke Aktiengesellschaft

GRÜNA 1. SA. GERMANY

Stitching Wire

(*Continued from page 108*)

block which has a groove for the wire, covered by an adjustable closure. This straightening block is used not so much to straighten the wire as to control the tension on it and thereby the exact size of the product. By its use the wire is either "braked" or allowed to run free, and this is an important detail.

✦ ✦ ✦

The Take-Up

THE take-up can be of several types. It may consist of a collapsible spool with a capacity of 4½ pounds or a standard steel spool such as is commonly used on stitching machines, or it may be an ordinary wire drawing block.

✦ ✦ ✦

IN any case it is driven by a round slip-belt. The direct spooling of the flattened wire saves one operation, but it is not good practice, since it is impossible to lay up the wire nicely on the spool with a heart-cam. Neither is it possible, nor safe, to correct the traverse by hand, for the tension is too great. There is the further disadvantage that after each 4½ pounds the mill must be stopped, the spool collapsed, bundle tied up, end secured and the mill started. If on the other hand, a regular wire block is used, the entire bundle can be run through the rolls without a stop.

✦ ✦ ✦

The Finished Wire

THE finished wire should be, as stated, .018 x .030 or .017 x .031. If it comes out .016 x .033, the top roll must be slacked off a little. If it comes out .017 or .018 in thickness the roll pressure is right, but if at the same time the width, instead of .031 or .030, measures .032 or .033, slacking off

BELL-MINE
ROTARY KILN
PULVERIZED
LIME

MANUFACTURED BY THE AMERICAN LIME & STONE CO. AT BELLEFONTE, PA. SALES OFFICES AT PITTSBURGH, NEW YORK CITY, PHILADELPHIA AND WILMINGTON

for wire drawing

A Home Away from Home

With the elaborate provision of a great organization available at the Mount Royal Hotel, there is lost none of that personal touch so dear to those away from home. At the Mount Royal Hotel as cheery a hospitality and as courteous a welcome await the stranger as at the little wayside inn where his coming is the event of the day.

VERNON G. CARDY, Managing Director.

Mount Royal Hotel
MONTREAL

the roll will bring the width down but will at the same time raise the thickness above the desired figure. This problem is solved by adjusting the braking effect or tension, on the round wire.

✦ ✦ ✦

THE wire is passed between staggered pins in the straightening block, and the increased drag results in a reduction in the width of the rolled section. The wire entering the rolls must be under uniform tension. If the tension increases, the width of the finished section will decrease — then the tension must be eased off by passing the wire around fewer pins.

✦ ✦ ✦

Roll Adjustments

ASSUME that two wires drawn in the same way, from the same steel, to the same size, are rolled in two mills which differ only in roll diameter. Although the thickness can be controlled so as to run .018 in both cases, the large rolls will produce a width of .031, and the small rolls perhaps .029, even though the tension was exactly the same. This is an invariable rule, that large rolls spread the wire more, and small rolls elongate it more. The reason is that with large rolls there is a greater amount of contact between the roll and the wire.

✦ ✦ ✦

ASSUME now that the annealing point is changed, so that the wire coming to the rolls is harder than normal. The roll diameter and tension are absolutely unchanged, but in rolling to the same thickness the hard wire will come out with a greater width. The rule is, "hard wire spreads more than soft wire." Let us make still a third assumption, that the wire after rolling is non-uniform in width. The cause of this lies in the preparation of the round wire—it was not uniformly annealed. The rule is "Non-uniform wire does not spread uniformly."

✦ ✦ ✦

AFTER all these difficulties have been adjusted the rolling can proceed. After a few minutes of rolling, the mill must be

stopped for a check gauging, and it will be found that the wire has lost a little in thickness and picked up a little in width. The heat of deformation and of friction is responsible, and has increased the roll diameter and the rolling pressure, which must now be readjusted. Other adjustments must be made from time to time until the mechanism has reached its maximum temperature.

✦ ✦ ✦

Wide Stitching Wire

IT now remains to discuss the wide stitching wire, 2 to 3 millimeters. The wire gets its last anneal at about .064, and is drawn to .046 to make about .104 x .012. It is a good idea to run a "shoe string" on these jobs, as the stock does not always behave the same way in the rolls. These wide, thin wires are rolled in two, or better, in three passes. The drafts are proportioned according to the stock and the mill. This last may sound strange, but the fact remains that two rolling mills apparently identical in every way, never work exactly alike. The coppering of book-binder wire is done just as in the case of ordinary wire. The wire is dipped in copper-sulphate, "wiped out" through a wooden block, and spooled. Tinning and galvanizing are done exactly as for ordinary wire. Flats are tinned or galvanized at the last round size, then rolled and spooled.

✦ ✦ ✦

A. M. Snodgrass Manager of Production Pittsfield General Electric Works

A. M. Snodgrass has been appointed production manager of the Pittsfield, Massachusetts, works of the General Electric Company. In the employ of the company 20 years, Mr. Snodgrass was superintendent of the meter department at Fort Wayne, Indiana, for several years prior to 1930. Since June 1st of that year he had been production manager of the West Lynn, Massachusetts, works of the company.

The LYON MEASURING MACHINE
WILL CHANGE YOUR WASTE TO PROFIT

by eliminating the material waste of excess footage. Supply your product to the trade with guaranteed measurement—not an estimate or an approximate figure—but exact linear measurement. Avoid the danger of short measure and at the same time eliminate excess footage. Change waste of material to dollars of profit through the mechanically exact measurement of the Lyon Measuring Machine.

EXTREME PRACTICAL ACCURACY

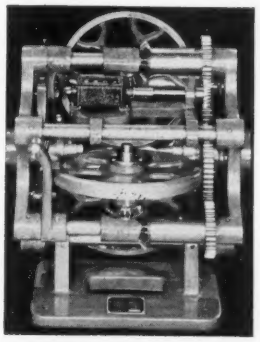
WIRE - ROPE - CABLE - CORD
BARE - INSULATED - ARMORED - B-X
TWISTED PAIR - ENAMELLED - CONDUIT

Write for additional information

LYON MEASURING MACHINE DIVISION

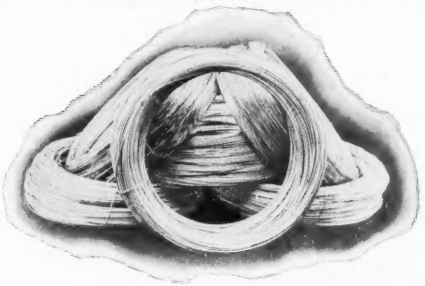
BARBOUR WELTING COMPANY

BROCKTON, MASS.



Patent Pending

SILVER BRIGHT GALVANIZED



We furnish this highly finished galvanized wire to meet your requirements as to coating, tensile strength, bend test, etc. Packed in coils or straightened and cut to length. Our organization will be glad to offer its long experience in wire problems toward the betterment of your product or a reduction in its cost. Call on us.

✦ ✦ ✦

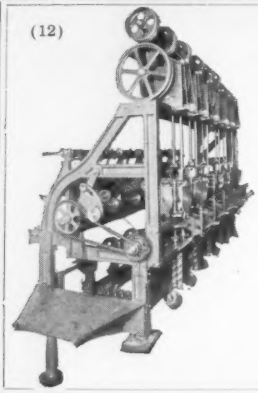
We make a complete line of nails in various sizes and types. Also the following kinds of wire:

BRIGHT BASIC	TINNED	ROPE WIRE
COPPER-BEARING	COPPERED	TELEPHONE WIRE
ANNEALED	"GALVANNEALED"	SPRING WIRE
LIQUOR FINISH		WELDING RODS

KEYSTONE STEEL & WIRE COMPANY

3000 Industrial Street — PEORIA, ILL.

(12)



VERTICAL MODEL TAPING MACHINE

for applying 3 Tapes on each of six lines of wire, for flat or round conductor, with wire straightening rolls and individual traverse for each line of wire; motor or belt drive.

EST. 1855 AIMCo INC 1915
"American" INSULATING MACHINERY COMPANY
REG. U.S. PAT. OFF.
517 West Huntingdon St.
PHILADELPHIA PENNSYLVANIA U.S.A.

RUESCH

MACHINERY
FOR
WIRE, TUBE AND BRASS MILLS

H. J. RUESCH MACHINE CO.
409 MULBERRY ST. NEWARK, N. J.

NEW ENGLAND BUTT COMPANY
ESTABLISHED 1842

BUILDERS OF

Insulated Wire Machinery

Write for catalog

Dept. W-4
PROVIDENCE, R. I.

CHICAGO OFFICE
20 NORTH WACKER DRIVE

NOTICE!

MANUFACTURERS OF WIRE MILL EQUIPMENT AND SUPPLIES

IF you have a product of unquestioned merit, requiring the highest type of intelligent, dignified and effective representation among the Wire Mills in the Eastern States, it will be of advantage to you to investigate the qualifications I have to offer.

THREE years of successful Sales-Engineering, plus a wide acquaintance among the Industry's chief executives should merit your consideration and lead to a mutually agreeable connection.

REFERENCES as to character and ability cheerfully furnished on request to firms of high standing in the trade.

WIRE & WIRE PRODUCTS: Box No. 225

'Round the World With The Wire Industry

(*Continued from page 111*)

Wire Nail Competition

THE Japanese competition in wire nails and similar products, which had been very keen through 1932 and also early this year, is now slowing down. The Japanese wire industry is overstocked with orders. Most of the wire nail manufacturers are fully booked up to 15-17 weeks ahead, although more machinery has been recently installed. As the Japanese manufacturers are unable to keep the agreed shipment times, the buyers are placing their orders in Europe. The Japanese prices, which for some time had been up to 20% below the continental prices, have now been advanced and are only from 5% to 7½% lower.

✦ ✦ ✦

Wire Netting Prices

THE IWECO has made fruitless efforts to advance the prices for wire netting. The majority of all continental makers are now members of the cartel and the Austrian, Hungarian and Swiss industry has ceased to sell for export, but in spite of the circumstances, the competition is very keen between the British and the continental makers, as the British industry is enjoying the advantage of lower import duties in the Dominions and Colonies. The present discount is still 90% off the British Standard list for large orders. This is only 40% of the prices in 1927. No other wire products declined as heavily. How low the prices are can be seen from one example as follows: 50 yard rolls of BWG 22x1″x20″ mesh, priced at £1.10.0 Gold, less 90% is 3 shillings Gold net. In other words one roll of 50 yards is sold only at 3 shillings f.o.b. packing included. These prices are ridiculously low and explain why in spite of the heavy transportation costs and the high duty of 60%, netting is still imported in very heavy quantities into the United

States. The cheapest price is for BWG 19x3"x6" which is selling now at a net price of 7¼ shillings per 50 yard rolls f.o.b. delivery.

✦ ✦ ✦

Wire Rod Demands In Germany

THE demand for wire rods is continuing satisfactorily. Great Britain is resuming purchase of Thomas steel wire rods, although she is exporting o.h. wire rods to Germany and Czechoslovakia. Japan and the Latin American countries are buying far more than last year and Scandinavian orders have recently been obtained. Prices are unchanged. It is expected that the next cartel meeting will again advance the allotment for all cartel members for the second quarter of 1933. The demand is particularly good for heavy coils of 300 to 400 lbs. which are shipped principally by Germany. Such wire rods are now demanded in Japan and Great Britain in spite of an extra charge of 2 shillings, 6 pence per ton.

✦ ✦ ✦

Reference Tables For Platinum To Platinum-Rhodium Thermo-Couples

THERMOELECTRIC thermometers made of platinum and platinum-rhodium alloys are extensively used for high-temperature measurements. Such instruments are usually calibrated at a number of known temperatures which can easily be reproduced, such as the melting points of various pure metals. The number of calibration points required can be greatly reduced by employing what is termed a "standard reference table," which is simply a complete calibration of an average instrument of the type in question. There was published as Research Paper No. 530, in the Bureau of Standards Journal of Research for February, standard reference tables for the two types of instruments ordinarily used. By the use of these tables, measurements at only two temperatures are required to obtain a complete calibration up to 2,700° F.

BALLOFFET

The Quality Diamond Dies

1870 1933

BALLOFFET DIAMOND WIRE DIES CO. INC.,
13-15 East 22nd Street, New York City
Factories in France: Lagnieu-Cluses-Trevoux

The crack trains, which pay best, are trusted solely to men, who have learned from—*Experience.*

—As wire drawers for over 30 years, we know from *Experience* the particular shape of die for each material. We have found from this same experience that our special casting method of setting is best.

Why not let us quote on your diamond die requirements?

DRIVER-HARRIS COMPANY
HARRISON, N.J.
Chicago Cleveland - Detroit - Morristown, N.J. - England - France Italy

PREMIER

Patents—Trade Marks

All cases submitted given personal attention by members of the firm. Information and booklet free.

Lancaster, Allwine & Rommel
PATENT LAW OFFICES
Suite 438, 815-15th St., N.W. Washington, D. C.

STRIP ZINC EYELETS
THE PLATT BROS. & CO.
WATERBURY, Conn.

Wire and Wire Products Buyers' Guide and Year Book of the Wire Association
1933 Edition Ready for Delivery
$5.00 per COPY

EFFICIENT PICKLING
REQUIRES "RODINE"

RODINE, SAVES ACID AND METAL. Prevents over-pickling. Minimizes acid brittleness and acid fumes.

Samples and Directions sent on request.

AMERICAN CHEMICAL PAINT CO.
AMBLER, PA.
Detroit Office & Warehouse 6339 Palmer Ave.; E.

EXPERIENCE is the name that we give to our follies. It is the record of pain, seldom the story of pleasure. Experience is the extract of much suffering; therefore, experience should have the advantage of much light.

W. H. SPOWERS, JR.

W. H. Spowers, Jr.
Consulting Engineer
551 Fifth Ave., N. Y. C.
Specializing in Galvanizing Plants Designed and Installed
Practical Engineering
Vanderbilt 3-7395 Advice

OTTO F. JAGIELSKI
Consulting Engineer
167 RADFORD ST., YONKERS, N. Y.
Specializing in manufacture of insulated wire and cable.
Modern equipments and plants designed and installed.
Development work on new machinery, methods and processes.
Practical engineering advice from rod mill to finished product.
Phone: Yonkers 3727

Kenneth B. Lewis
CONSULTING ENGINEER
Wire Mill Equipment, Layout and Practice
17 East 42nd St. New York City
43 Midland St. Worcester, Mass.
Phone: Murray Hill 2-4188
Phone 5-6033

Broden Construction Co.
Wire Mill and Cold Rolling Equipment
10255 Harvard Ave.
CLEVELAND, OHIO

WIRE MILL EQUIPMENT
MORGAN CONSTRUCTION CO.
WORCESTER, MASS.

Wire Mill Equipment, Stranding, Insulating, Drawing, Welding
Thomson-Judd Wire Machinery Co.
Subsidiary of
Thomson-Gibb Electric Welding Co.
Lynn, Massachusetts.

Willard R. Carroll

Willard R. Carroll, Rolling Mill Engineer of the Farrel-Birmingham Company, Inc., Ansonia, Conn., died at his home at New Haven, Conn., on February 3, 1933.

Mr. Carroll was born in Meriden, Conn., in 1872. His early education was obtained in the public schools of that city, following which he attended Scheffield Scientific School of Yale University.

Mr. Carroll was widely known throughout the brass and copper industry where he had a reputation as an outstanding engineer. He developed the largest tube drawing machine ever built in the United States and the first tube mill for non-ferrous seamless tubing, and was responsible for numerous other developments and improvements in the design and operation of rolling mills.

In 1925 he joined the Farrel Foundry and Machine Company as a consulting engineer on the rolling mill work. During his service with this company and its successor, Farrel-Birmingham Company, Inc., he designed the first roller bearing copper rod mill, which is responsible for extraordinary economies in operation and increased output.

Prior to his connection with the Farrel company he conducted a consulting engineering business of his own and at various times had been on the staffs of non-ferrous metal producers and machinery builders as engineer, superintendent and works manager.

Mr. Carroll was highly esteemed for his personal qualities as well as for his professional ability by all of his associates and his many friends in the trade and his passing is deeply regretted.

He is survived by one daughter.

WIRE DRAWING MACHINERY AND EQUIPMENT
Rod Frames—16" Frames, 8" Frames —Take-Up Frames, Wire Pointers—Puller Tongs.
General Castings for Wire Mill use.
Circulars on Request.
E. J. Scudder Foundry & Machine Co.
Trenton, N. J.

WIRE STRAIGHTENING AND CUTTING MACHINERY
FOR ALL SIZES, SHAPES AND KINDS OF WIRE
The F. B. Shuster Co.
New Haven, Conn.
Straightener Specialists Since 1866

John Royle & Sons
Paterson, New Jersey
Makers of Extruding Machines and Hose Looms.

Wire Drawing Diamond Dies
COCHAUD
WIRE DIE CORPORATION
300 W. 56th ST., NEW YORK
Tel. Col. 5-1340

VIANNEY
Famous Wire Drawing Diamond Dies
250 EAST 43rd ST., N. Y. CITY

BUYERS' GUIDE

For more complete information, consult the annual Directory, Index & Buyers' Guide.

ACID RESISTING PIPES AND FITTINGS
Haveg Corporation, Newark, Del.

ANNEALING FURNACES
See Furnaces—Various Headings

ANNEALING POTS AND BOXES
National Wrought Iron Annealing Box Co., Washington, Pa.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

BAKERS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CASTINGS—Wire Mill
E. J. Scudder Foundry & Machine Co., Trenton, N. J.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.

CHROME NICKEL—Construction
National Wrought Iron Annealing Box Co., Washington, Pa.

CLEANING & PICKLING EQUIPMENT
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

COILERS—Sheet and Wire
H. J. Ruesch Machine Co., Newark, N. J.

CRANES—Wire Mill
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

DIES—Composition
Vianney Wire Die Works, New York, N. Y.

DIES—Diamond
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Co., New York.
Driver-Harris Co., Harrison, N. J.
Vianney Wire Die Works, New York.

DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Corp., New York.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Vianney Wire Die Wks., N. Y.

DIES—Recutting and Repolishing Machine
Vianney Wire Die Works, New York, N. Y.

DIES—Rod and Tube Drawing
Carboloy Co., Inc., Newark, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tantalum Carbide
Vianney Wire Die Works, New York, N. Y.

DIES—Tungsten Carbide
Carboloy Co., Inc., Newark, N. J.
Driver-Harris Co., Harrison, N. J.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DRAW BENCHES—
H. J. Ruesch Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

ENGINEER—Consulting Wire Mill
Jagielski, Otto, Yonkers, N. Y.
Lewis, Kenneth B., New York, N. Y.

EYELETS—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FURNACES—Annealing
Electric Furnace Co., Salem, O.

FURNACES—Automatic
Electric Furnace Co., Salem, O.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, O.

FURNACES—Electric
Electric Furnace Co., Salem, O.

FURNACES—Lead Melting
Electric Furnace Co., Salem, O.
John Robertson Co., Brooklyn, N. Y.

FURNACES—Non-Oxidizing
Electric Furnace Co., Salem, O.

GALVANIZING ENGINEER
W. H. Spowers, Jr., New York, N. Y.

FURNACES—Wire
Electric Furnace Co., Salem, O.

GALVANIZING KETTLES—
National Wrought Iron Annealing Box Co., Washington, Pa.

INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Wm. M. Parkin & Co., Pittsburgh, Pa.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

LIME—Pulverized
Amer. Lime & Stone Co., Bellefonte, Pa.

LUBRICANTS—Wire Drawing
R. H. Miller Co., Homer, N. Y.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
John Robertson Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Brazing
Thomson-Judd Wire Machinery Co., Lynn, Mass.

MACHINERY—Bunching
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Machinery Co., Philadelphia, Pa.
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Watson Machine Company, Paterson, N. J.

MACHINERY—Chain Making
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

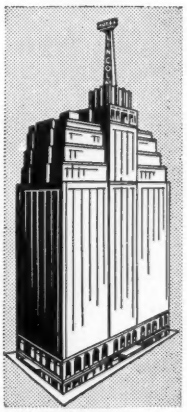
MACHINERY—Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Fred'k M. Conran, Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Coilers
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

IN THE HEART OF NEW YORK

TO STAY AT THE LINCOLN . . . IS A HAPPY REMEMBRANCE



Special suites and sample rooms for visiting sales representatives.

An interesting cosmopolitan atmosphere . . Cheerful Rooms . . Pleasant Service . . Delicious Meals . . Moderately Priced . . Around the corner are theatres, clubs and glamorous Times Square . .

Conveniently accessible to railroad terminals, steamship piers, the business and shopping centers . .

"A Perfect Hotel for The Visitor"

ROOM *with* PRIVATE BATH, RADIO *and* SERVIDOR

$3 *single per day* **$4** *double per day*

Special weekly and monthly rates.

HOTEL LINCOLN

JOHN T. WEST, *Manager*

44th to 45th Sts.—8th Ave.—New York

UNDER NEW MANAGEMENT "A RELIANCE HOTEL"

BUYERS' GUIDE, Continued

MACHINERY—Copper Wire Drawing and Rolling
Kratos-werke Aktiengesellschaft Gruna 1. SA. Germany
H. J. Ruesch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cutting
Broden Construction Co., Cleveland, O.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Extruding
John Robertson Co., Brooklyn, N. Y.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Forming
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Galvanizing Wire
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Gang Winders
H. J. Ruesch Machine Co., Newark, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Insulating
American Insulating Machinery Co., Phila.
New England Butt Co., Providence, R. I.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
John Robertson Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Measuring Wire & Cable
Lyon Measuring Machine Division of Barbour Welt ng Co., Montello, Mass.
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Panning
American Insulating Machinery Co., Phila.

MACHINERY—Pointing
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rod Mill
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Const. Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Lewis F'dry & Machine Co., Pittsburgh, Pa.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Lewis F'dry & Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
H. L. Reusch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rubber Strip Covering
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila Pa.
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry and Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Machinery Co., Phila.
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening Hollow Wire
Fred'k M. Conran, Newark, N. J.

MACHINERY—Stranding
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester. Mass.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Lewis F'dry & Machine Co., Pittsburgh, Pa.
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Swaging
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Company, Paterson, N. J.

MACHINERY—Tinsel Rolling Mills
Amer. Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Welding Wire
F. B. Shuster Co., New Haven, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Fred'k M. Conran, Newark, N. J.
Kratos-werke Aktiengesellschaft Gruna 1. SA. Germany
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Company, Paterson, N. J.

PACKING—Metallic Fibre
Hudson Wire Co., Ossining, N. Y.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.

PICKLING AND PLATING TANKS
Haveg Corporation, Newark, Del.

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila., Pa.

POTS—Lead Melting
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Encasing
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

PULLERS—Wire
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
John Robertson Co., Brooklyn, N. Y.

REELS AND SPOOLS—All Kinds
R. B. Hayward Co., Chicago, Ill.

REEL AND TENSION STAND—
Sleeper & Hartley Inc., Worcester, Mass.

REEL CRUTCHES
R. B. Hayward Co., Chicago, Ill.
Watson Machine Co., Paterson, N. J.

ROLLING MILLS—See Machinery—Rolling Mill

ROLLS—
Lewis F'dry & Machine Co., Pittsburgh, Pa.

SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.

SPOOLS—Aluminum Alloy
Lestershire Spool Co., Johnson City, N. Y.

STEEL PLATE CONSTRUCTION—
National Wrought Iron Annealing Box Co., Washington, Pa.

STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

TANKS—Compound
Haveg Corporation, Newark, Del.
Watson Machine Co., Paterson, N. J.

TANKS—Steel Plate
National Wrought Iron Annealing Box Co., Washington, Pa.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS
H. J. Ruesch Machine Co., Newark, N. J.

VULCANIZERS
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS
American Insulating Mach'y Co., Phila., Pa.

WIRE—Enameled For Coils
Winsted Insulated Wire Co., Winsted, Conn.

WIRE—Manufacturers
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Nickel Silver and Phosphor Bronze
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.

WIRE—Non Ferrous to Specification
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.
Winsted Insulated Wire Co., Winsted, Conn.

WIRE—Steel—Also Coppered Steel—Also Glavanized Steel
Keystone Steel & Wire Co., Peoria, Ill.

WIRE AND STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

Electric Cable and Wire Rope Machinery :

STRANDERS	Planetary & Rigid Frame types (*horizontal and vertical.*) High-Speed Tubular and Built-up types.
BUNCHERS	High-speed types for spools up to 1500 lb. capacity.
ARMORING MACHINES	For Wire (*planetary type*) and for Tape.
PAIRING & TRIPLING MACHINES	For Bare & Insulated Wire.
CLOSERS	For Wire in Planetary, High-speed & Angular types.
CLOSERS & CABLERS	For electric cable in Planetary and Angular types.
TAPING MACHINES	Eccentric and Concentric types, for Paper, Friction and Varnished Cambric and Burlap types.
TAPING HEADS	For applying steel tape in Eccentric and Concentric high-speed types.
JUTE & BURLAP	Applying Heads.
THREAD SERVERS	For Cotton, Asbestos, etc. application on hose and wire.
COMPOUND TANKS	Electrical or Steam heated for machine or unit application.
CHALK APPLIERS	Wet and Dry types.
CAPSTAN SECTIONS	With Single tapered and double grooved wheels, with Lay Control by gears of variable speed transmission.
LET OFF REEL STANDS	Shaft and Shaftless types, for any size of reels.
WINDERS	For steel and copper, in single or multiple head units.
COILING MACHINES	Power or manual drive for package coiling—also for warehouse and shipping room use.
COILING HEADS	For wire rope and insulated wire and cable.
TAKEUP STANDS	Inclined frame, Shaftless and Heavy-duty types.
TRAVERSES	Light and Heavy, manual, mechanical and motorized.
TEMPERING & GALVANIZING MULTIPLE HEAD TAKEUPS	For wire.
MEASURING MACHINES	For Length Measurement.
ELECTRIC PATCH VULCANIZERS	
SATURATING, WAXING & GREASING TANKS	Gas fired and Electrical.
WIRE TINNING MACHINES	Gas fired and Electrical.
CABLE PEELERS	For removing lead sheathing and insulation.
POLISHING HEADS	Separately or Motor driven.
REEL CRUTCHES	For turning heavy reels in handling and shipment.
MOTORIZED WINCHES	For general duty in cable and rope plants.
CUTTERS	For wire rope, cable and chain.
SPOOLS	Heavy-duty for Rope-Mills and Cable-plants.

Send for descriptive catalogue.

ELECTRICAL WIRE AND CABLE—WIRE ROPE AND CORDAGE MACHINERY

THE ELECTRIC FURNACE COMPANY
ELECTRIC AND FUEL FIRED INDUSTRIAL FURNACES
GENERAL OFFICES AND WORKS
SALEM, OHIO, U.S.A.
CABLE ADDRESS 'EL FURNO' SALEM

F. A. HOILES, PRES.
R. F. BENZINGER, V. PRES.
F. T. COPE, TREAS.-GEN. MGR.

1933

Continuous Furnaces for
BRIGHT ANNEALING
Ferrous and Non-ferrous Metals

Metal ... New York,

Attention - Mr. Frank ...

SUBJECT: Continuous Brazing
and Bright Annealing

Gentlemen:

You are, of course, constantly on the lookout for methods to lower your costs and improve the quality of your product.

We have developed an inexpensive furnace atmosphere which will bright anneal, normalize and deoxidize anneal steel in a continuous furnace. Sheet, strip, tubing, stampings, semi or finished parts, etc., can be bright annealed, deoxidize annealed or bright normalized in this type of equipment.

Silver, copper, nickel-silver, red brass, in sheet tubing, coils, straight lengths or wire is delivered from the furnace bright and dry.

The most intricate steel parts or assemblies are brazed and delivered from the furnace continuously

Pickling and acid embrittlement are eliminated. The surface of the metal is superior to a pickled surface.

Our engineering department will be glad to consult with you, submit samples of our work and complete operating costs.

Very truly yours,

THE ELECTRIC FURNACE CO.

R. F. Benzinger
Vice President

THE ELECTRIC FURNACE CO.
SALEM, OHIO.
Fuel Fired Furnaces
Electric Furnaces